TECHNICAL DEPT.

AVIATION

The Oldest American Aeronautical Magazine

OCTOBER 11, 1926 **Issued Weekly** **PRICE 15 CENTS**

Navy Vought UO-1's (Whirlwind Engines) of the Scout Cruiser and Battleship Division

VOLUME XXI

NUMBER 15

SPECIAL FEATURES

A FLYING TOUR OF THE NEAR EAST—LESTER D. GARDNER
EXPERIMENTAL DETERMINATION OF STRENGTH OF METAL WING

GARDNER PUBLISHING CO., INC.
HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK
Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office, at Highland, N. Y. under Act of March 3, 1879.

TOLEDO PUBLIC LIBRARY

Boeing Pursuit Ship

SPEED-

Packard-powered Boeing FB 3 sets new world's record of 180.495 miles per hour for standard pursuit ships

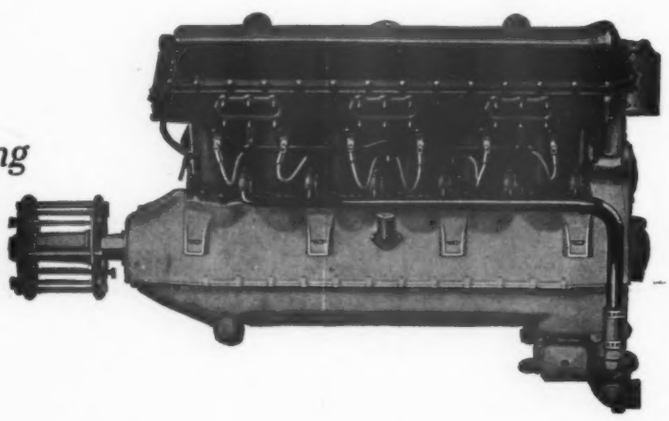
TENTH to start in a field of twelve, the Boeing FB 3 which won the Pursuit Ship Race in the recent National Air Races steadily forged ahead past plane after plane and established a new world's speed record of 180.495 miles per hour for standard pursuit ships.

To win in place would have been a striking achievement in itself, but to win and at the same time to forge ahead to the front ranks of the field, was an unusually spectacular demonstration not only of the speed of the Packard-powered Boeing plane, but of its ease of handling and maneuvering, and of the skill of its pilot, Lt. C. T. Cuddihy, U.S.N.

In this race, as in so many previous races, Packard Aircraft Engines again demonstrated their supremacy in speed, in efficiency, and in dependability.

PACKARD MOTOR CAR COMPANY
DETROIT MICHIGAN

Eleven Years of Packard Pioneering in Aircraft Motor Development 1915-1926



The Winning Engine

Packard Model 1500, power plant of the Boeing FB 3 plane, which recently established a new world's record of 180.495 miles per hour for standard pursuit ships. Develops 600 B.H.P. at 2500 R.P.M. Three types — direct vertical, direct inverted, and vertical with two to one reduction gear.

ASK THE MAN WHO OWNS ONE

OCTOBER 11, 1926

AVIATION

VOL. XXI. NO. 15

Published every Monday

CONTENTS

Editorials 621

An Air Tour of the Near East 622

A "Wings Across the Sea" Luncheon..... 626

Experimental Determination of Strength of Metal Wing 628

Publisher's News Letter..... 655

GARDNER PUBLISHING COMPANY, Inc., *Publishers*

BUSINESS AND EDITORIAL OFFICES: 225 FOURTH AVENUE, NEW YORK
CABLE ADDRESS: AEROENG
Publication Office
HIGHLAND, N. Y.

Subscription price: Four dollars per year. Canada, five dollars. Foreign, six dollars. Single copies, fifteen cents. Back numbers 25 cents. *Copyright 1926, by the Gardner Publishing Company.* *Issued every Monday. Forms close ten days previously. Entered as second-class matter Nov. 22, 1920, at the Post Office at Highland, N. Y., under act of March 3, 1879.*

SCINTILLA

AT THE NATIONAL AIR RACES

The Boeing FB-3 piloted by Lt. G. T. Cuddihy
Won the Free-for-All Pursuit Ship Race
Powered with a PACKARD Engine
equipped with

SCINTILLA

The Wright Apache piloted by Lt. C. C. Champion was powered with a
PRATT and WHITNEY "WASP"
equipped with
American Built

SCINTILLA

AIRCRAFT MAGNETOS

SCINTILLA MAGNETO COMPANY, INC.
SIDNEY, N. Y.

A PREDICTION REALIZED

The New Curtiss "FALCON"

DURING the past several months, the first group of Curtiss "Falcons" to be delivered to the Army have been undergoing service tests in the hands of Air Corps pilots. As was foreshadowed when the "Falcon" won first prize in the Observation Competition at McCook Field, this new observation airplane has rapidly gained favor with the flying personnel, who have found it much faster and more maneuverable than the present service type.

Powered with either the Curtiss D-12 or the Liberty motor; excellent from a maintenance standpoint; with a truly remarkable performance, the "Falcon" fulfills its advance indications of being the finest observation type in service today - a worthy "big brother" to the Curtiss "Hawk", the standard service pursuit plane of the U. S. Services.

FIRST - SECOND - FOURTH - FIFTH - *in the Liberty Engine Builders' Race for observation airplanes at the Philadelphia National Air Races.*

THE CURTISS AEROPLANE & MOTOR COMPANY, INC.

OFFICES:
GARDEN CITY, N. Y.

Curtiss

FACTORIES:
Garden City, N. Y. and Buffalo, N. Y.

L. D. GARDNER
PRESIDENT
EARL D. OSBORN
VICE PRESIDENT
L. D. WEBSTER
TREASURER
GEORGE NEWBOLD
BUSINESS MANAGER

AVIATION

W. LAURENCE LEPAGE
EDITOR
VIRGINIUS E. CLARK
RALPH H. UPSON
CONTRIBUTORS

VOL. XXI OCTOBER 11, 1926 No. 15

The New Air Regulations

THE ANNOUNCEMENT that the Department of Commerce will modify the drastic rules that appeared in its first draft of the regulations for aircraft, operators and pilots and which were published last week in AVIATION will be welcomed by everyone interested in the progress of American aeronautics. It is unfortunate that these hastily prepared and wholly unnecessary and restrictive regulations were issued, even for the consideration of the people most concerned. The one requirement for this most important step in the control of commercial aeronautics is mature study and advice from those who are to bear the burden of the new regulations.

A great danger that was generally feared showed itself immediately. The effect of this form of control abroad is too well known to require further critical comment. No one that appeared at the congressional hearings on the Bill advocated the meticulous regulation used abroad, and yet, in the first draft, there will be found incorporated, word for word some of the most objectionable details of European regulation..

Parts of the French regulations appear to have been copied without any consideration being given to recent developments. Such a method of preparation is not one that will indicate that care and consideration that should have been given to a first effort of this kind was shown.

Fortunately, the attention of Secretary MacCracken has been called to these severe and unnecessary requirements and he appears to be entirely willing to have them modified. The hearings on the new rules will continue for several weeks and then a new draft will be made. At that time, everyone interested in the effect of the regulatory rules of the Development of Commerce should give his final opinion of the requirements and use every effort to have them as broad and simple as possible.

The End of a Great Flight

ON THE completion of his third aeronautical triumph, Alan Cobham, the well-known British long distance pilot, arrived back in London, from Melbourne, Australia, after a flight of a total distance of approximately 26,000 miles, on the afternoon of Oct. 1. If there are any who have some misapprehensions as to the real value of long distance record breaking flights, they should look to this last achievement of Cobham for some enlightenment. Alan Cobham does not go in for spectacular flights as such. Nevertheless, his trips are all spectacular because of the care with which he carries his undertakings to success His aims have always been to demonstrate to the World at large and to the people of his own country in particular, the possibilities of long distance air navigation lines. And he carries out these aims with the certainty of clockwork.

The story of Alan Cobham's London-Melbourne-London flight is one which, for many years, will be read with a deep thrill of admiration from the entire World aeronautical community. It will tell how he set off from the Old World town of Rochester when the English countryside was bathed in warm June sunshine. Entering the Mediterranean, he continued on into the scorching heat and across the vast plains and deserts of Arabia encountering sandstorms, heat and rain. It was in the Iraq Delta that Mr. Cobham lost his mechanic and trusty friend, Elliott, who was shot from the ground by an Arab. Sergeant Ward of the R.A.F. took Elliott's place and the flight to Australia continued. Almost inconceivable difficulties were overcome in India where the flight was carried on through the heavy monsoons. It was during this part of the outward flight that the fliers were not heard from for three or four days. Cobham pushed on, still fighting storms and finally reached Rongoon. He arrived at Melbourne on Aug. 15 and left again on the return flight on Aug. 29, intending to dash home, but severe monsoon storms made his flight slow in the vicinity of Burma.

What has been learned from the flight it is perhaps a little early to discuss. It is significant that, for a flight half way around the World, Cobham chose to employ a seaplane, indicating the possibility that with the exception of those air routes which serve one continent only such as the airways system of this country and of Europe, the great trunk airways of the World will be operated with large seagoing planes. It is too early to draw any definite conclusions on this but the possibility is certainly indicated by Mr. Cobham's flight. Then again, there is no doubt that air-cooled engine proponents will look with considerable satisfaction on the successful conclusion of this flight for it is certainly a triumph for this type of aircraft engine. It is significant too that, in his last long flight, that from London to Capetown and back, Cobham chose an air-cooled engine.

Alan Cobham has employed the identical airplane on each of his last three great flights, London-Rangoon and back, London-Cape Town and back, and London-Melbourne and back. The total mileage of that de Havilland 50 must be very high but the variety of extreme weather which it has passed through without severe deterioration is a far more significant feature, and will serve to give some indication of the life of a commercial air transport machine.

It is estimated that Alan Cobham has flown approximately 500,000 miles in his extended air journeys. He has announced that he would never give up flying but will take a well earned rest by lecturing in the United States. When he arrives in this country he will be welcomed as one of the best known figures in the realm of flying. He deserves universal approval for his achievements in fostering the development and extension of air transportation.

An Air Tour of the Near East

By LESTER D. GARDNER

(FIFTH PART)

TO THE newly arrived air tourist in Baghdad, the number of interesting local sights to be seen and the historical places to be visited will create a bewildering state of mind that only becomes cleared by a visit to them. Baghdad is the aviation center of the Middle East, as this part of the country is also called. From here air routes that have been pioneered as mail lines by the Royal Air Force will some day take passengers to the south and connect with the steamers at the Persian Gulf and to the north to Mosul and connect with the air lines that will come down through Turkey from Europe and connect with branches to Persia. For the purpose of this brief account, the country between Babylon and the Turkish frontier will have to be regarded as a regularly operated air line, only it is not as yet taken over by a commercial company for the convenience of passengers.

In another article, the history, operation and achievements of the Royal Air Force will be given the detailed treatment that they should have and some of those who have made aviation history in Iraq introduced to AVIATION'S readers. As this series of articles is concerned only with the commercial aviation possibilities of the country, the more important and significant military use of aircraft here will have to wait.

If a thin cresent were laid over the map, beyond the Arabian Desert, with one tip at the Persian Gulf where the two rivers made famous by our earliest progenitors, the Euphrates and the Tigris, join and empty, and the other in the mountains of Kurdiatan, the fertile part of Iraq would be bounded. It was here that the earliest historical references we have, of mankind, give us facts that the traveller will wish to trace. The garden of Eden, Mount Arrarat, the cities of Ur, Babylon, Nineveh, not to omit the later Baghdad and Ctesiphon, all beckon and those who get so far from the beaten track of travel will not want to return without visiting some of these memorable places. But here is where air transport will provide about the only practicable means of viewing these historic spots without great inconvenience and loss of time. Take the trip to Babylon as an instance. By air, it is only a hundred miles from Baghdad or a very short hour's ride. The dust and the heat is avoided and when seen from the air the view is so much more impressive that there is not the slightest doubt that the air tourists that come this way in the future will demand that a taxi service, at least, be available for this side trip. Flying to Babylon, is one of the most extraordinary air trips conceivable. After half an hour, the huge ruins of the Parthian palace at Ctesiphon is reached. If this great pile were in any accessible part of the world it would have been one of the seven wonders, but located, as it is, in a most difficult locality to reach, it has remained available only to the more intrepid travellers.

The Arch of Ctesiphon

The huge arch spanned the great hall of Chosroes who was the most powerful King in the world in his time. After he had sacked Jerusalem, he brought the remains of the Holy Cross here and for long it remained. The entrance to the hall was covered with one of the largest carpets or rugs ever manufactured, it being a hundred feet high. From the air, these ruins look even more impressive than from on the ground,

Royal Air Force Photo.

The Arch of Ctesiphon, below Baghdad on the Tigris. The opening of great hall of Chosroes was covered with a huge carpet. This is one of the largest arches ever built. The whole structure is made of brick.

Royal Air Force Photo.
The ruins of Babylon which have been excavated. The width of the brick walls used is noteworthy. Each brick bears the mark of the ruler who built the palace or house.

for from here the tracings of the large city that surrounded the palace can be seen running down to the Tigris.

Babylon—The World's First Great City

Crossing from the fertile shores of the Tigris which are lined with date palms, to the Euphrates, only about twenty minutes by air, the ruins of Babylon come into view. The first of the mounds to attract attention, for all of the old Iraq cities are now mere mounds, is the hill that is regarded as the famous Tower of Babel where the confusion of tongues occurred. The slope of the hill going down to the river which is covered with the ruins of many houses is the only remaining traces of the Hanging Gardens of Babylon, one of the seven wonders of the ancient world. Flying over the city itself, the temples and streets that have been uncovered in recent years by antiquarians, the outline of the hall of Belshazzar, where Daniel translated the handwriting on the wall, as well as the walls that surrounded the capital, can be seen at a single glance. As the city of Babylon at the height of its glory was many miles around, the only general idea of the immense area that it covered can be secured from an aerial view. In another hour, the traveller is back in Baghdad, having in a short two hours seen what it would have taken days to cover by ordinary means of transportation, and at the same time seen more of the grandeur of the historic ruins than could be viewed in any other way.

Modern Baghdad

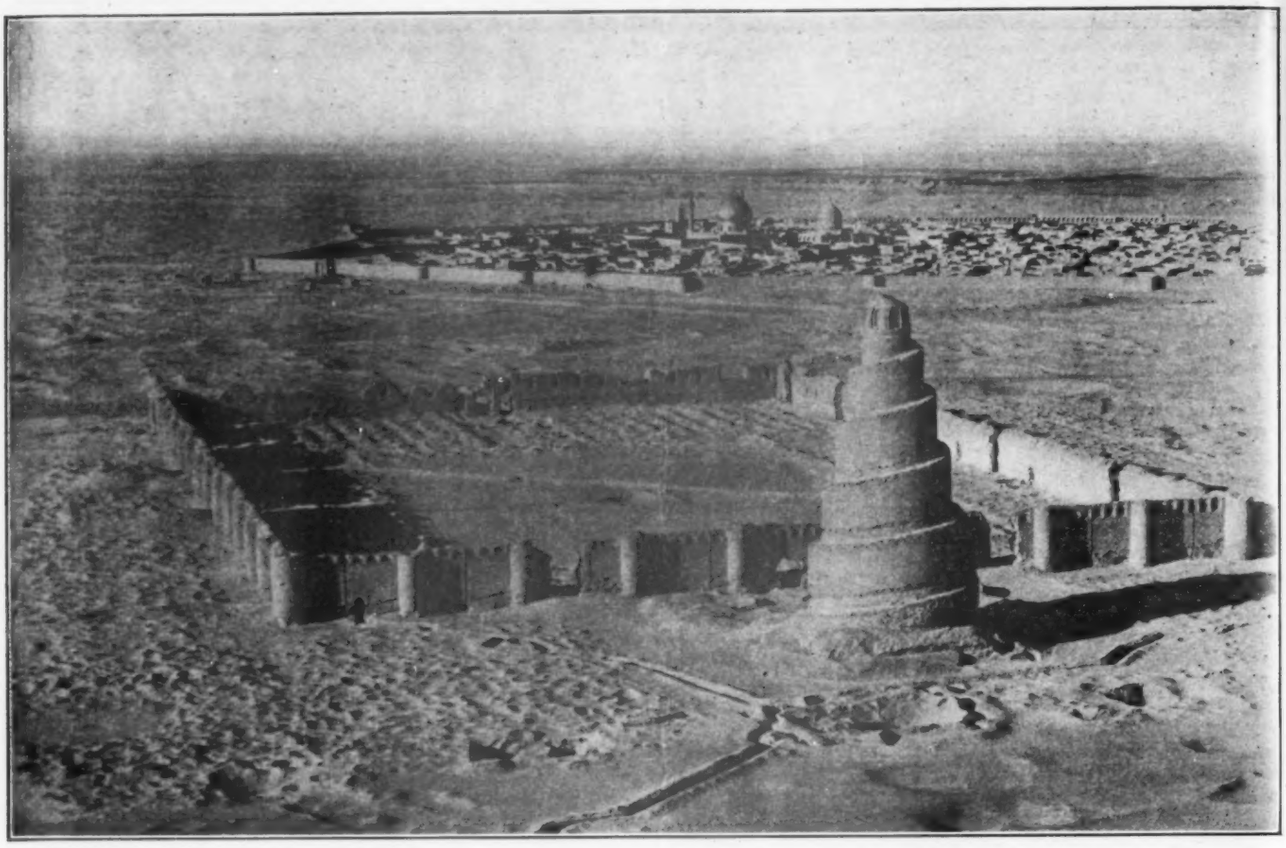
The city of Baghdad is comparatively modern, when compared with Babylon and Nineveh whose history runs back six or seven thousand years. It has been destroyed so many times that the old streets of Haroun al Raschid are no more but lie to the north of the present location. The mosques, tombs, bazaars, stores and homes all have oriental interest but the river shore with its odd boats has the most attractions for the newcomer.

To the north of Baghdad, when one is flying, the first place to be seen is the city of Kahdimain with its famous mosque shrine that has two of the most picturesque domes in the world. They are covered with beaten gold and may be seen for miles around. As these sacred places may not be entered by infidel Christians, the only way to get any adequate impression of them is from the air. Here again is to be seen the great advantage of this mode of travel. A few miles to the north, another and even more sacred city comes into view. It is Samarra, where a Mohammadan prophet disappeared from view into a cave and who it is believed by the faithful will, after ten thousand years, come back out of the cave to reclaim the world. Over the spot, a beautiful shrine has been built and here two domes, one of gold and one of blue tiles rise out of the desert plain. The city is surrounded by a wall and has the appearance from the distance of one of the European walled cities of medieval times.

The Holy City of Samarra

Samarra, was the capital of the Caliphs, after Baghdad became too metropolitan for them. The ruins of the old city may be seen for miles. It was over twenty miles long and the city of New York could be placed inside its boundaries. The streets may still be traced and from the air it looks like a map rather than the ruins of an ancient city.

Following the Tigris, a series of more ruined cities may be viewed, the most noteworthy of which are Assur the capital of the Assyrians, and Nimroud, the home of the earliest and



Royal Air Force Photo.

The walled city of Samarra with domes of gold and blue. In the foreground is one of the oldest known religious towers, the forerunner of all church spires. The old city of Samarra extended for over twenty miles. Turkish trenches used during the war may be seen under the tower.

most famous of hunters. In an hour or so the famous site of the capital of the world, after Babylon, is reached and Nineveh is to be seen occupying the mounds on the eastern side of the river. Opposite is Mosul, the leading city of northern Iraq.

If this were an account of travel, instead of a flying trip, a whole chapter might be written about the wonders of Nineveh, with its palaces, statues and walls but having flown three hundred miles in a morning Mosul is more restful than the deserted and desolate site of city of the Assyrian Kings.

The tomb of Jonah, however, which is located on one of the mounds of Nineveh had a curious attraction, for here may be seen, by the credulous, some of the actual bones of the famous whale, but to the informed they appear to be the teeth from a sword fish.

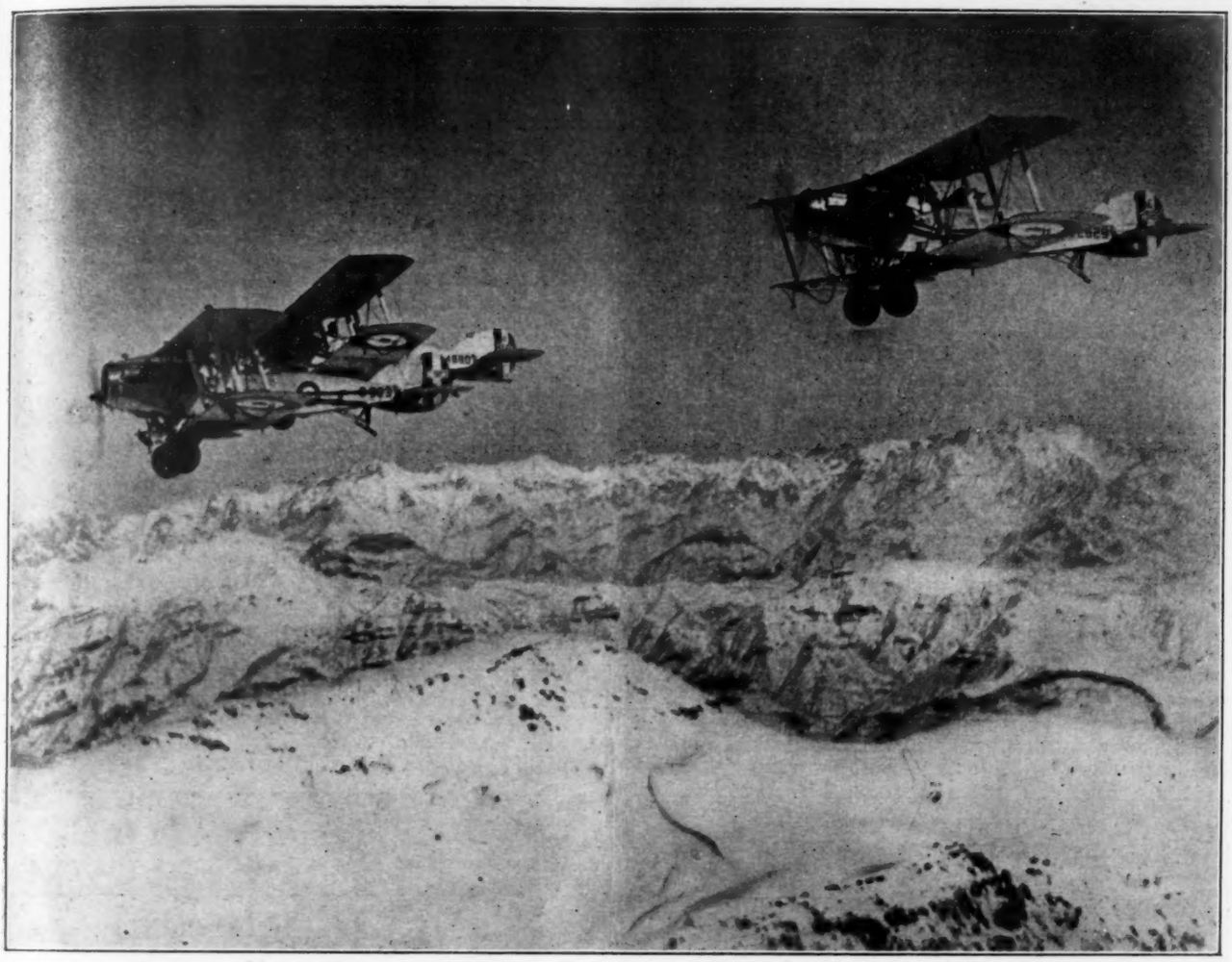
Wicked Nineveh

Mosul is even more interesting than Baghdad as it has not been in contact with the outer world as much as the more centrally located city. Here may be found the greatest conglomeration of races, religions, languages and people that can be found in any other city of the Near East. The Kurds and the Arabs are in the majority but Christians of a dozen different sects, Hebrews, Devil Worshipers and other followers of very little known religions brush elbows in all the streets. The minaret of the mosque is almost as famous in this part of the world as the Leaning Tower of Pisa, only here the minaret leans in two directions. The people believe that when Mohammed was lifted into another world from Mecca he passed over Mosul and the minaret leaned as a sign of reverence. How it received the other kink is not revealed.

To the north of Mosul lie the mountains of Kurdistan, some of them rising to a height of twelve thousand feet and covered with snow all the year round. From the air, these wild mountains with no landing places give an impression of grandeur greater than the Alps. At a later time, a detailed account of the flight that was made over this desolate region will be written and a tribute paid to the R.A.F. pilots who fly this country as a regular daily routine.

Returning to Baghdad, only a few hours by air, the next plane to the Holy Land is boarded in the late afternoon and the night is spent at Hinaidi. The experience of sleeping in

The Hills of Kurdistan North of Mosul



Royal Air Force Photo.

A patrol flying over the mountains of Kurdistan along the Turkish border. This view was taken near the mountain on which the Ark of Noah is believed to have rested after the Flood.

the desert in the open under the stars and moon, surrounded by a barbed wire fence to protect the camp from the prowling animals is another of the experiences that ought to be related as a travel adventure rather than in the account of an air tour. Early in the morning the trial balloons were sent up to get the meteorological observations and at dawn the convoy was on its way across the desert again. By eleven o'clock, the deserted city of Ziza was reached and again the great herds of camels scattered while the Vickers Vernon landed.

Here, instead of taking the direct route back to Cairo, a detour to Jerusalem was made on the mail plane.

Transjordania's Capital

From Ziza to Amman, the capital of Transjordania is only twenty miles and is covered in as many minutes. This is the old Philadelphia of the Greeks and the ruins of their theatres and other public buildings are to be seen from the air. A detour, by air, of an hour to the north brings the Syrian border into view, with the Druse country spreading out as far as the eye can reach to the northeast. This is the district where the rebellious Druses have made almost continuous trouble for the French who have a mandate for Syria.

With Jerusalem as the next place to be seen, only the most hardened air traveller could not betray his impatience. Taking off from Amman, the limestone hills of Palestine are encountered immediately and any hope of a landing place is given up.

Soon, the valley of the River Jordan is seen in the north and the entire length of the Dead Sea to the south. While flying at five or six thousand feet, the peculiarities of the unique ground contours may be observed. The Jordan has eroded the wild and desolute valley that it flows through for so long that where it empties into the Dead Sea it is 1300 feet below sea level. The hills of Moab may be seen to the east of the Dead Sea and hilly Eastern Palestine to the West.

Beneath, as the river valley is crossed, Jericho may be seen but to the west the eyes strain to catch a first glimpse of Jerusalem. As it is only a few miles away, it gradually becomes more distinct until the view that must be a climax of any air tour is reached. The Mount of Olives, with the Garden of Gethsemene, rises to the east of the city walls. The view from the air of these revered places of the Holy Land is only exceeded in interest by the city itself.

Jerusalem from the Air

The first group of buildings to be seen is called the Dome of the Rock, and is now covered with mosques, but which in the days when the Hebrews ruled the city was covered by the Temple of Solomon. David's Tower, and the Church of the Holy Sepulchre can be identified amid the maze of tightly built houses and shops. The whole of the old city is clearly demarked from the surrounding country by the walls, and the famous Jaffa and Damascus gates can easily be seen.

There is no other sight in the world that has in it such an appeal to the imagination; where so many of the events of one's earliest historical and religious training come to mind; where the great of the earth have come as humble worshippers, and where every Christian, Hebrew and Mohammedan claims a part interest.

This view, with Bethlehem to be seen only five miles distant can fittingly close these sketchy preliminary notes on an air tour of 21000 miles. A decription of the experiences, the scenic beauties, the personalities as well as the technical aviation features will be left for specialized accounts of the air companies and the aviation activities of the countries.

A "Wings Across the Sea" Luncheon

British Aircraft Industry Honors American Aviation with Dinner to Lester D. Gardner.

THE FRIENDLY spirit that is shown American aeronautical visitors from the United States was once more indicated by the distinguished group of British aircraft enthusiasts who gave a luncheon at the Hotel Savoy in London to Lester D. Gardner, publisher of AVIATION, before he returned to the United States.

The Guests

At the guest table were the Chairman, Capt. P. D. Acland, Vice-Chairman of the Society of British Aircraft Constructors, The Rt. Hon. Lord Thomson of Cardington, Mr. F. Hanley Page, Air Vice Marshal Sir W. Sefton Brancker, Mr. C. R. Fairey, Air Vice Marshal Sir W. G. H. Salmon, Col. Sir Francis K. McClean, Air Vice Marshal Sir Vyell Vyvyan, Mr. Philip S. Foster, Chairman, Air League of the British Empire, Mr. H. T. Vane, Sir Sigmund Dannreuther, Deputy Secretary of the Air Ministry, Mr. F. A. Macquisten, Member of Parliament and Rear Admiral Murray F. Sueter also a Member of Parliament.

To quote from the account of the luncheon as given by The Aeroplane:

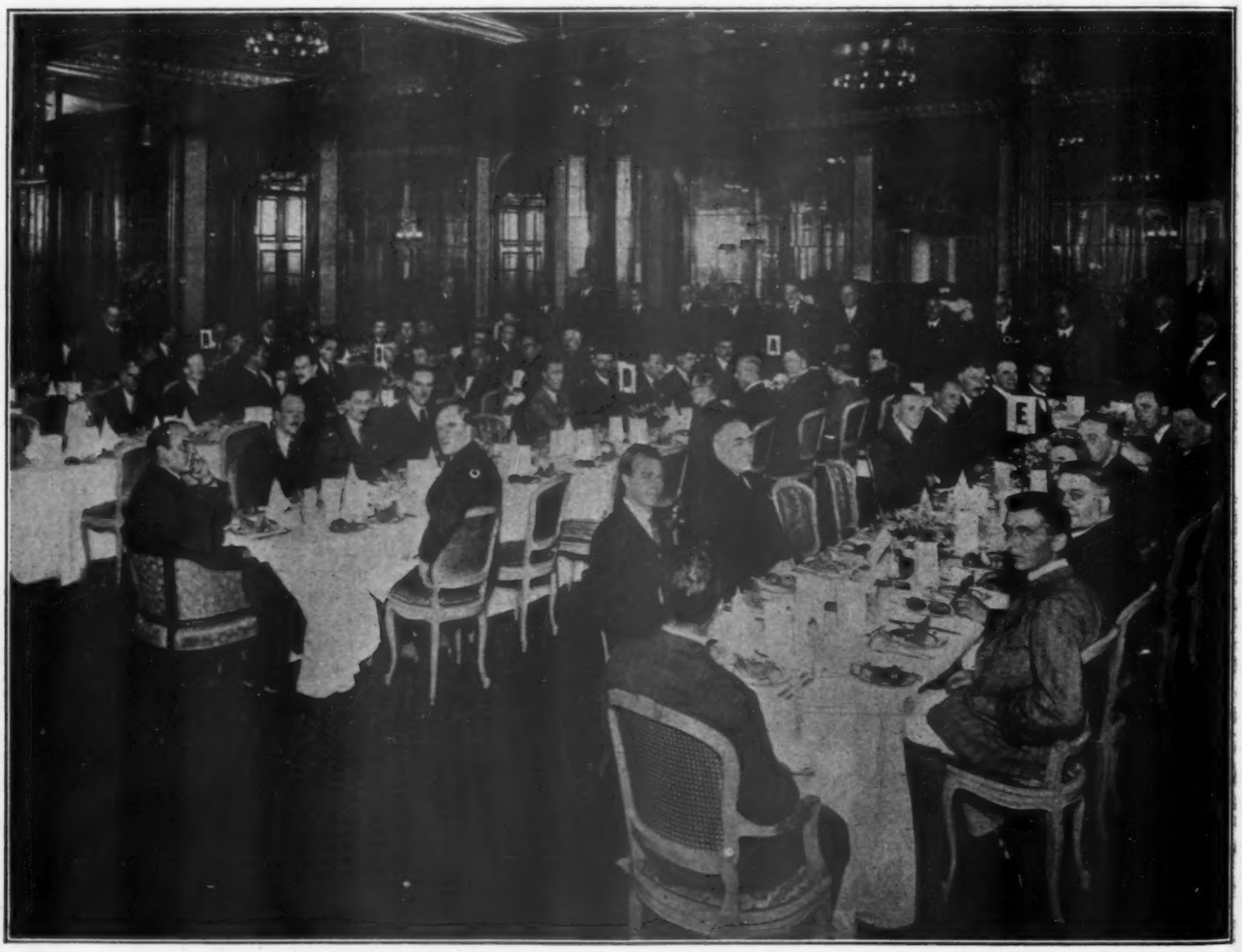
"The Luncheon was given partly because the S.B.A.C. to a man, like Mr. Gardner very much, and partly to celebrate his extraordinary air-trotting feat of covering 21,000 miles by air without accident, a performance which has been neglected by the British Press with that genius for missing the things which matter and concentrating on the futilities of life which is so typical of English newspapers.

"After the usual loyal toast, and after drinking the health of the President of the United States (which surely ought to be drunk in water), Captain Peter Acland, of Vickers, Ltd., the Vice Chairman of the S.B.A.C., proposed the health of Mr. Gardner. He said that we had assembled to meet a business man who had come over to see whether there were any air lines operating in this part of the World, and we wanted him to explain, after his experiences, what air travel meant."

Lord Thomson's Views

"The Lord Thomson of Cardington, the new Chairman of the Royal Aero Club, said that he recognized in Mr. Gardner an enthusiastic supporter of aviation who had won the admiration of the aeronautical community. He had made the Aerial Grand Tour of Europe, Africa and Middle East.

"It was really a remarkable achievement to have flown 21,000 miles in 53 days without stress or strain. He had slept in a bed in a hotel or private house every night during these journeys, he had run no risks, and he had returned in the condition they saw today. There was no business man but must recognize the utility of traveling in this manner and of being able to cut out railways and boats, and to substitute this lounging method of transport.



Luncheon given to Lester D. Gardner by the Society of British Aircraft Constructors at the Savoy Hotel, London at the conclusion of his 21,000 mile air tour.

"He, Lord Thomson, and Mr. Gardner had met before in New York. They had much in common. They had both flown to Baghdad and back by the Desert Route, and he was confident that Mr. Gardner would agree that it was a vital link in World communication. The real value of the work which the R.A.F. were doing in Iraq was that we were doing so much for humanity in linking up communication. He had always maintained, often in the face of acrimonious criticism, that the money we spent in this way was a first class investment.

"He and Mr. Gardner had also both been to Bucharest. He himself had been Military Attache there for two years. In the course of his duties he had to send in reports, and in one he had to state what was the National Sport. There was a certain amount of sport of a kind but the Roumanian ladies were extraordinarily attractive and he reported accordingly that the national sport was "the assiduous cultivation of the fairer sex", or words to that effect. He asked Mr. Gardner whether his experiences in Bucharest did not confirm this.

"Becoming serious, Lord Thomson said that we owed Mr. Gardner a debt of gratitude for his rare and encouraging contribution to aviation."

Mr. Gardner's Story

"Mr. Lester Gardner said that he felt the embarrassment of the situation. He had expected to meet a few of his friends in the Aircraft Industry but he did not expect this distinguished gathering. He felt that it was there to honor not himself but the Aeronautical Chamber of Commerce of America, of which he was an unofficial representative. This honor was an evidence of the growing feeling of cordiality between the people of England and of the United States.

"He said he had come over without any intention of doing anything spectacular. He had just come to see a few friends but he had found opportunities of doing a lot of flying. Those who were closest to aviation sometimes felt unfavorably towards air transport, but he thought that they ought to show their belief in its safety by personal demonstration. And he said that his own belief in it was proved by the fact that Mrs. Gardner accompanied him for nearly 5,000 miles of his 21,000 miles of flying, and that Mrs. Gardner now flew with a feeling of relief that she was not compelled to use trains and boats.

"Mr. Gardner said that he felt genuinely amused at the idea that a business man flying around as he had done should be regarded as extraordinary. He was sure that aviation was now just at the turning point, for it was possible in these days to fly everywhere. A person could fly to Casablanca, Constantinople or Moscow, as easily as going by rail. What had been called "air-trotting" might be a new diversion for jaded globe-trotters. It would provide them with a new form of sport.

"He had been asked how much he had seen of the World during his journey. Calculating that on an average he could see for 25 miles on each side of the line along which he was travelling, he calculated that he had seen 1,000,000 square miles of Europe, Asia and Africa.

"With the developments which were now going on, he felt that Civil Aviation would soon be Commercial Aviation and that subsidies would no longer be necessary. He said that the old slogan of hands across the sea seemed a little worn out. Aviation would promote solidarity between the people of England and America, so he asked the company to drink to 'Wings Across the Sea'. Which they did with good will."

Others Present

Others at the luncheon were:

Lieut. Comdr. C. Dennis Burney, Member of Parliament; Lieut. Comdr. The Hon. J. M. Kenworthy, Member of Parliament; Lieut. J. de Vaisseau, French Air Attache; Commander G. Vassiliades, Greek naval and air attache; Major H. C. Davidson and Major C. Tinker, American Air Attaches; Major G. E. Woods Humphrey, Imperial Airways; Air Commodore, A. M. Longmore, Air Ministry; Major A. R. Boyle, Air Ministry; Major F. R. McMahon, Air Ministry; Major G. P. Bulman, Air Ministry; Major J. S. Buchanan, Air Ministry; Major P. Bishop, Air Ministry; Mr. B. E. Holloway, Air Ministry; Major A. Innes, Air Ministry; Mr. H. E. W. McAnally, Air Ministry; Major H. Jullerot, Vickers Ltd.; Capt. O. H. D. Vickers, Vickers, Ltd., Mr. John Lord, A. V. Roe & Co.; Mr. C. G. Grey, The Aeroplane; Mr. A. D. Roy, Vickers, Ltd.; Mr. H. Guy Fiske, Boulton and Paul, Ltd.; Major Oliver Stewart; Capt. S. R. Proctor, Armstrong Siddeley Motor, Ltd.; Col. Nichol, Fairey Aviation Co.; Mr. C. C. Walker, De Havilland Aircraft Co.; Sir Ernest Petter, Westland Aircraft Works, Ltd.; Mr. R. H. Pierson, Vickers, Ltd.; Flight Lieut. P. W. S. Bulman, H. G. Hawker Eng. Co., Ltd.; Capt. D. Nicolson, S. E. Saunders, Ltd.; Mr. Hugh Burroughes, Gloucestershire Aircraft Co., Ltd.; Major F. A. de V. Robertson; Mr. D. Jones, D. Napier & Son, Ltd.; Mr. W. Lappin, Rolls Royce, Ltd.; Mr. Geoffrey Dorman, The Aeroplane; Mr. J. T. Brown, Asst. Secy. S.B.A.C.; Capt, R. Burgess, Rolls Royce, Ltd.; Major R. H. Mayo, Aircraft Operating Co., Ltd.; Mr. Griffith Brewer, Royal Aeronautical Society; Mr. G. Buyver, Flight; Mr. F. G. T. Dawson, Fairey Aviation Co., Ltd.; Mr. B. Stevenson, Asst. Secy. Royal Aero Club; Mr. R. M. Atkinson, Vickers, Ltd.; Mr. J. Laurence Pritchard, Hon. Sec. Royal Aeronautical Society; Capt. F. Crossley Broom, Vickers, Ltd.

The Aeronautical Chamber of Commerce of America passed the following resolution regarding the luncheon:

> WHEREAS, the Society of British Aircraft Contractors have honored American Aviation by giving a luncheon to Lester D. Gardner, a Governor of the Aeronautical Chamber of Commerce of America, at the Hotel Savoy in London, on July 29th, 1926, now, therefore, be it unanimously
>
> RESOLVED: That the Aeronautical Chamber of Commerce of America, through its Board of Governors, formally expresses its appreciation and sincere thanks for this evidence of goodwill and friendly courtesy by the Society of British Aircraft Constructors. Recognizing in such events and the cordial relations which exist between the aircraft constructors of Great Britain and the the United States, great promise for the future development of all aviation, by bringing closer together those who are endeavoring through their technical skill and practical application of the art, to advance the science of aeronautics, the Aeronautical Chamber of Commerce of America extends felicitations and greeetings on "Wings Across The Sea", to the Society of British Aircraft Constructors.

Lights for St. Louis-Chicago Airway

In a preliminary report submitted to Wm. P. MacCracken, Jr., Assistant Secretary of Commerce for Aviation, Airway Superintendent W. J. McKensie recommended the installation of twenty-four revolving two-foot beacons to equip the St. Louis-Chicago route for night flying. MacKensie recently returned to Washington after putting in 31 hr. and 45 min. flying time on the airway, surveying lighting requirements. He was away nine days.

He also recommended that nine emergency landing fields, each about 40 acres in extent and selected to permit safe landing from any direction, be established along the route about 30 miles apart. He suggested that each field be lighted at night by 20 white lights evenly spaced and arranged five on each of the four sides.

The Chicago-St. Louis Airway, about 277 miles long and which takes in Springfield and Peoria, is now used by the Robertson Aircraft Corp. in flying two planes a day which are quipped to carry mail, passengers and freight. With the approach of the winter months, the flights time of these planes will be during darkness and the installation of the revolving lights will be expedited to meet that need. Their present schedule is arranged so that they can connect with the transcontinental fliers at Chicago.

Whenever air traffic on the route warrants such use, the big revolving lights, operated from fifty foot metal towers built into a concrete base, will be in service all hours of darkness. They will work automatically, sending light beams into the sky visible approximately fifty miles from an aircraft during favorable weather. Local power will be used when available.

Experimental Determination of Strength of Metal Wing

Wind Tunnel and Static Tests on Wing of Edo Metal Flying Boat.

By ALEXANDER KLEMIN

Daniel Guggenheim School of Aeronautics, New York University

PRESSURE DISTRIBUTION tests in the wind tunnel and static strength tests have recently been conducted at the Daniel Guggenheim School of Aeronautics of New York University for the wing used in the new Edo Aircraft Corp. flying boat, now in process of construction at College Point, L. I., N. Y., to the designs of B. V. Korvin-Kroukovsky, the chief engineer of this company.

The design of the wing panel provides a most interesting illustration of what skillful design can achieve in so varying the elements of a wing along its span as to produce desirable aerodynamic characteristics, and at the same time so as to provide spar depths corresponding to the loads imposed at different points of the wing span. The structural design of the wing also provides a novel and ingenious attack on the problem of eliminating twisting effects in a monoplane without resorting to multiple spar construction.

Pending complete description of the seaplane, which no doubt will follow the flight tests, an outline of its main characteristics will clarify both the aerodynamic and structural aspects involved.

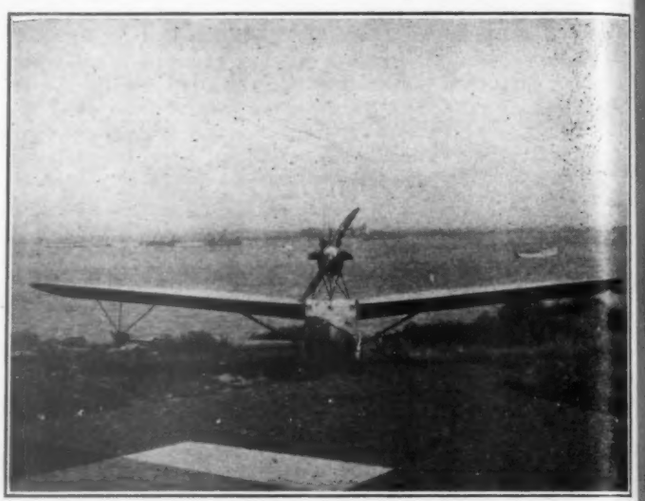
Brief Description of Plane

The boat is a monoplane, the wing being in line with the upper part of the hull and supported by a V strut on either side. The wing is hinged at its point of attachment to the hull. Accommodation is provided for pilot and three passengers, and the engine is a 75 hp. Anzani. The following are the general characteristics of the seaplane:

Span	45 ft. 0 in.
Length overall	24 ft. 8 in.
Chord	5 ft. 6 in.
Angle of incidence	5 deg.
Dihedral	6 deg.
Area of wing	226.5 sq. ft.
Loading per sq. ft.	9.0 lb.
Weight per hp.	27.2 lb.

Aerodynamic Form of Wing

The general character of the wing, for which the Aeromarine No. 2-A was used as the base section, is shown in Fig. 1. The wing has a high upper and lower camber at the root, with comparatively little spar depth. From the root outward, the upper camber increases slightly and the lower camber diminishes until there is a pronounced Phillips entry and spar depth is increased. Thereafter, the upper camber diminishes and the wing passes into a thin double-cambered section at the wing tips.



Front views of the Edo flying boat giving a very good idea of the clean lines of the machine. A close inspection of the photograph will reveal the changing depth of the wing across the span.

The model used for the wind tunnel tests was a semi-span airfoil 25 in. long, with a chord of 6.6 in. Half the span with a protecting disk was used, so that the largest possible model could be inserted in the tunnel. Ten capillary brass tubes of 1/32 in. internal diameter were let into the wing, and from small holes in these tubes the pressures on the upper and lower surfaces of the wind model were measured. Ten holes in each tube on each surface gave a total of 200 holes at which observations were made. The pressures were measured with the Krell type gauge as the difference between the pressure at the wing and a side plate in the tunnel.

The Edo flying boat (Anzani, 75 hp.)

The model was tested at angles of attack of 2½ deg., 0 deg. and 13½ deg. referred to the chord line. These settings were taken to correspond to diving, high speed and low speed conditions, respectively and tests were made at an airspeed of 40 m.p.h.

From the results, lines of equal pressure at the three conditions of test were obtained, diagrams of which are shown in Figs. 2, 3, and 4.

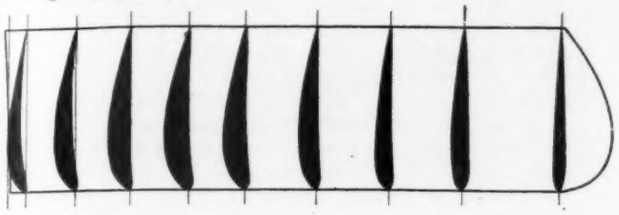


Fig. 1.

Also from the curves along the chord the coefficient of pressure normal to the wing was obtained. The average values of this normal pressure were as follows:

Condition	K_n	*Incidence*
Low speed	1.000	13½ deg.
High speed	.1938	0 deg.
Diving	.00896	—2½ deg.

The wing meets the stress requirements of the design admirably. At the root there is high camber, but comparatively little spar depth, which is as it should be, since the bending moments are zero at the hinge. Where both the maximum bending stresses and the direct compression of the left truss occur, the wing has its maximum spar depth. Toward the tip where the stresses are low, the spar depth reaches approximately a minimum value.

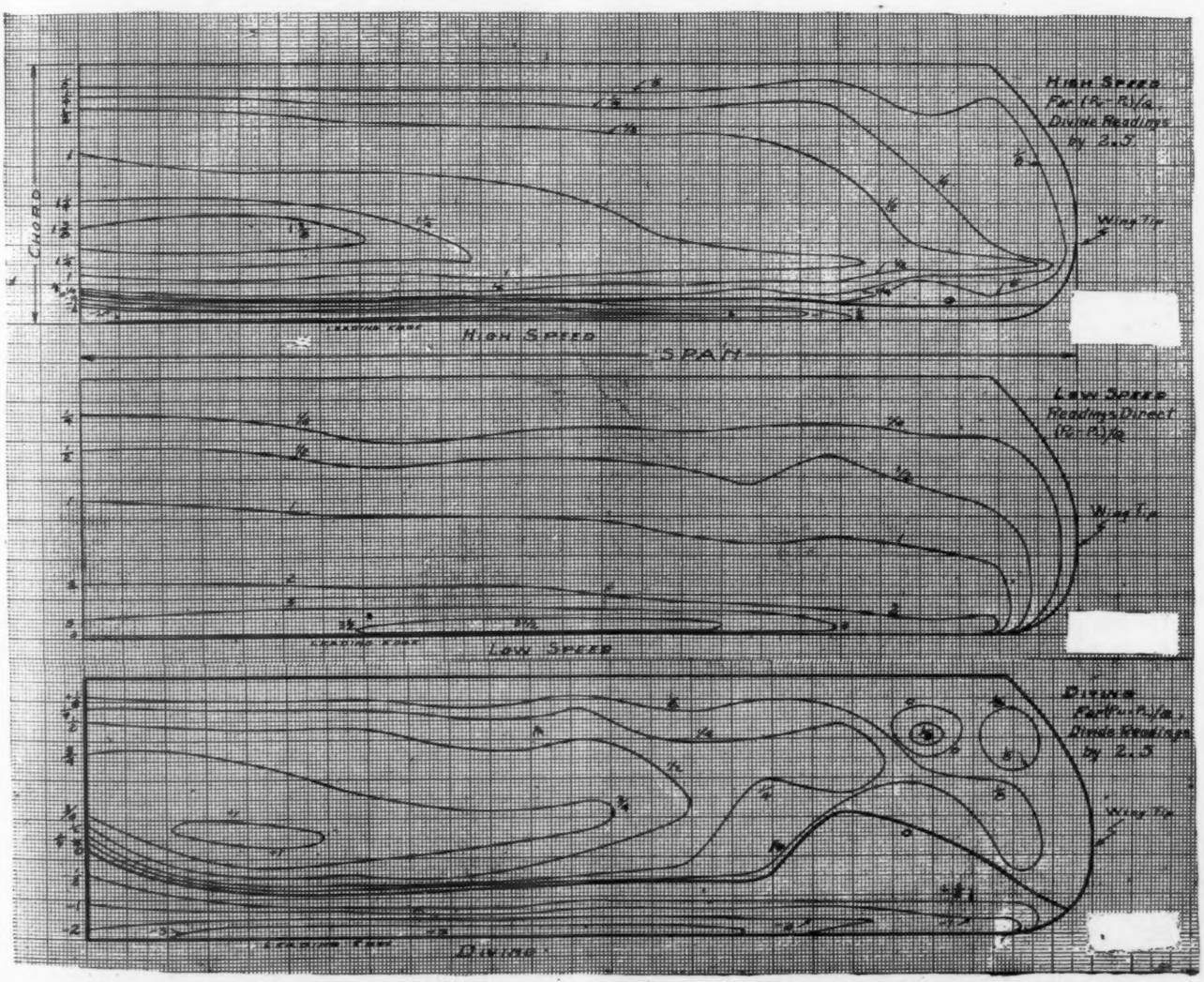
But it is, perhaps, more remarkable that by utilizing the now generally accepted theory that the lift of a wing element depends not on the thickness but on the camber of the median line, the designer has combined with excellent structural characteristics, a pressure distribution along the span which is highly desirable aerodynamically.

Elliptical Loading Aimed At

By the now well-known theory of induced drag for airfoils, it is advantageous to have an elliptical pressure distribution along the span of the wing. The induced drag due to the tip vortices is thereby reduced to a minimum for a given value of the lift coefficient. Reducing the induced drag is particularly important at high lift coefficient corresponding to climb, when the induced drag becomes the preponderating part of the total resistance of the wing.

That elliptical lift distribution is advantageous has been demonstrated not only theoretically, but also in the wind tunnel (see Ergebnisse der Aerodynamischen Versuchanstalt Zu Gottingen, Vol. 1, Part IV—3).

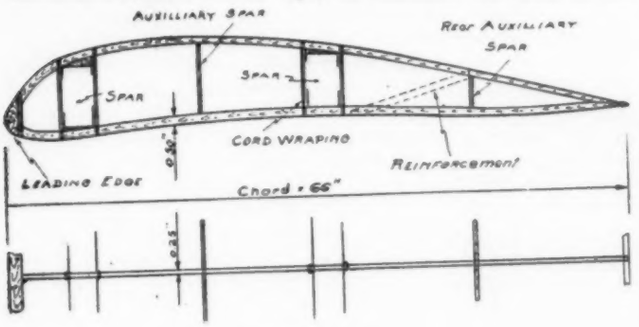
In the Gottingen experiments it was sought to obtain an elliptical lift distribution by progressive decrease in the angle of incidence or wash-out toward the tip. In the Edo wing, elliptical lift distribution has been obtained at both high incidence and low incidence without change in the angle of incidence.



Figs. 2, 3, and 4. Lines of equal pressure across the span

While no dynamic tests have been made of the Edo wing, it would seem that a greater maximum L/D would be obtainable by variation in camber to secure elliptical lift distribution than "mit einem verwundenen Flügel", as in the Göttingen experiments. With elliptical lift distribution and no wash-out the induced downward velocity of the air is the same at all points along the span and the effective angle of incidence is likewise the same along the span. All elements of the wing are, therefore, simultaneously at their best L/D.

It may also be conjectured that the maximum lift will be greater than with a washed out wing. In the washed out wing, the center elements will stall while the outer elements are several degrees below the stall. In the wing with diminished camber at the tips, all elements will stall at the



RIB CONSTRUCTION
Fig. 5

same angle. Even though the outer elements are of smaller maximum lift, the total resultant lift should approximate more nearly to the maximum lift of the rectangular wing with no attempt at elliptical lift distribution.

From curves of Fig. 2, 3 and 4, it would appear that regions of high local pressure at the wing tips such as are found in a rectangular plan form wing disappear. This has previously been obtained by giving the wing a pronounced negative rake. The disappearance of such regions has an important bearing on the structural strength of the wing, particularly when aileron loads are applied.

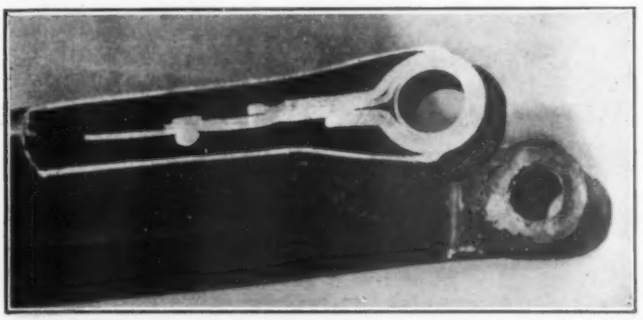


Fig. 8. The construction of the hull strut blot hold

The thin double cambered section at the tip should be sensitive to aileron movement, and at low angles of incidence there should be little or no yawing moment introduced by the ailerons. At high angles of incidence, the design of the wing is such that aileron action should be better than for the rectangular wing of constant section, but not as effective as for the washed out wing.

At the diving condition the distribution of lift is what might be expected for the thinned out wing, with double cambered section at the tip. The fact that zero lift occurs at a smaller negative angle than for the basic Aeromarine 2-A is also as might be expected.

Spar Construction

The spar of the full-scale wing are built entirely of duralumin plates and angles. The depth of spar varies along the span in accordance with the camber of the wing, the maximum depth of the front spar being 6.67 in., and of rear spar 6.41 in., or 10.1% and 9.72% of the chord, respectively. The flanges also vary in width, the width being 2 11/16 in. at the hinge, and 1 51/64 in. from there to the tip. The number of plates in the top and bottom flange is varied. The design of the spar flanges shows great refinement in apportioning material to correspond to the stresses coming on the spar. The bulb angles are rivetted, back to back, along the span, with the web intervening. The number of cover plates varies along the spar in accordance with stress requirements to a maximum of two, where the outer wing struts are attached and the cantilever bending moment is a maximum. The cover plates are 0.1265 in. thick, and are rivetted along the span to the angles. The web varies in depth in accordance with the camber, and in thickness from a maximum of 0.064 in. at two-thirds of the span from the root, to a minimum of 0.040 in. at the tip. The webs at points of juncture are rivetted to a U-channel. Stiffeners reinforcing the webs are placed at

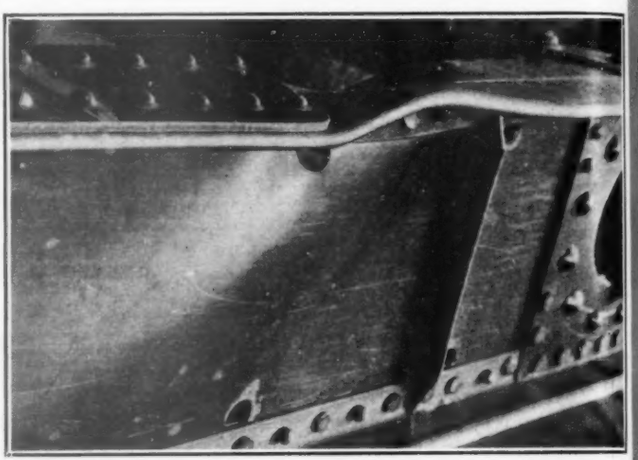


Fig. 9. The buckle in the main spar

intervals along either side of the spar, their distance apart varying from a minimum of 3½ in. to a maximum of 10 in.

The compression struts are either circular or polygonal in form. The tube at the point of attachment of the strut and that next to the wing hinge are rectangular, taking compression alone. The polygonal tubes are almost circular in form. These compression tubes also serve as torsion tubes. In case of unequal loading, deflection, and slopes in the front and rear spars, the tubes are put in torsion and, therefore, tend to resist twisting of the wings as a whole. Toward the tips the torsion tubes are smaller in diameter. They take up practically no compression, but must be able to twist through the larger angles resulting from greater deflections and unequal slope of deflection curves for the front and rear spars at the tips of the wing. By having the diameter smaller, the stress per square inch of material remains nearly the same as for the larger tubes twisting through smaller angles. The internal bracing wires are placed in two planes, corresponding to those of the upper and lower spar flanges, and also opposite twist to some extent, besides transmitting the drag forces.

Wing Rib Construction

The ribs are of wood, and of the simplest possible construction, as shown in Fig. 5. They are built of simple ash battens, steam bent to shape, and fastened to the spars with cord, the cord being waterproofed with glue. There is a light, wooden false spar running between the main metal spars, and another aft of the rear spar. These auxiliary spars help to maintain the shape of the wing. There are short nose ribs between the main ribs, extending to just aft of the forward spar.

The load distributions used in the static tests were based on the charts of pressure distribution obtained in the wind tunnel. The tests were made at zero degrees corresponding to high speed condition and at 13½ deg. corresponding to low speed condition.

The weight to be placed on the wing was calculated from the equation:

The Washington Monument

From Washington to the "Sesqui" —via the Valsparred route!

Blazing a Valsparred trail, the Fokker Trimotor planes of the Philadelphia Rapid Transit Air Service fly twice daily between Washington and the "Sesqui."

During the first month of operation the planes were forced to stand out in the weather unprotected, because the service was established on such short notice that hangars could not be made ready.

"That they are in perfect condition today," writes R. B. C. Noorduyn, Treasurer of the Atlantic Aircraft Corporation which built them, "is once again evidence of the thoroughly weatherproof construction of Fokker planes, in the attainment of which Valspar plays a most important part."

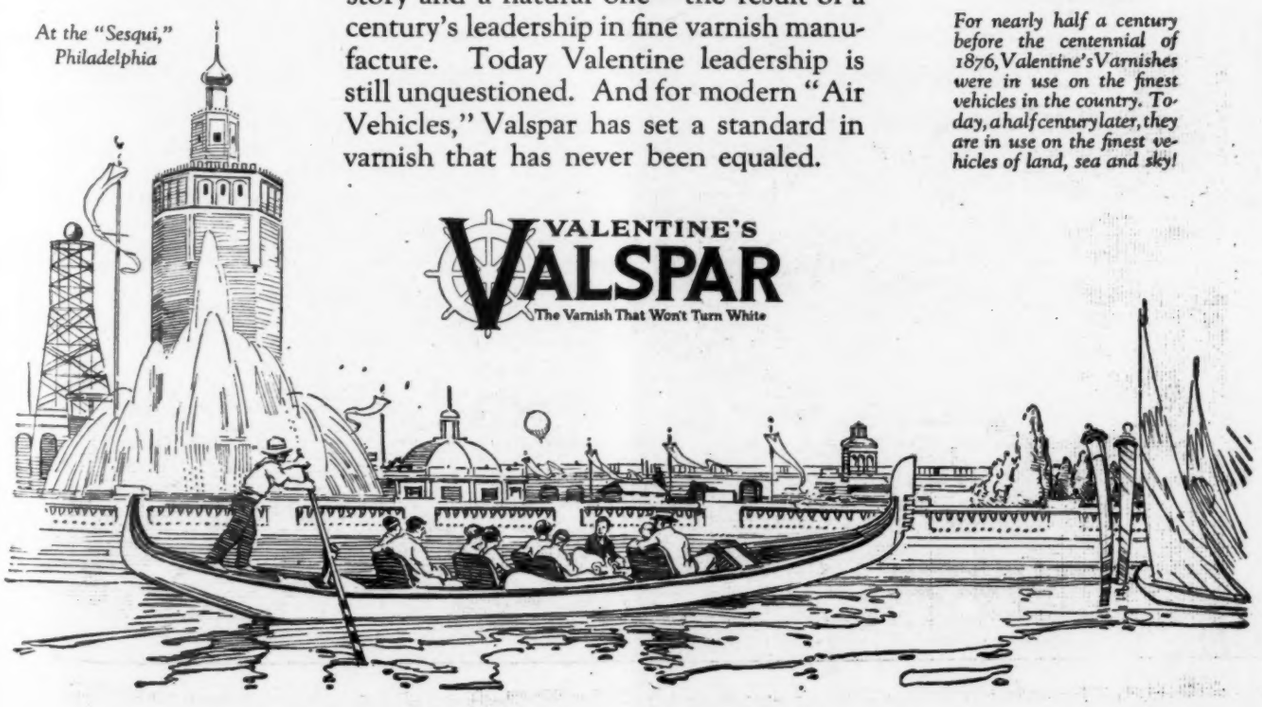
Such proof of Valspar's weatherproof qualities is an old story and a natural one—the result of a century's leadership in fine varnish manufacture. Today Valentine leadership is still unquestioned. And for modern "Air Vehicles," Valspar has set a standard in varnish that has never been equaled.

Before the 1876 Centennial —and after!

For nearly half a century before the centennial of 1876, Valentine's Varnishes were in use on the finest vehicles in the country. Today, a half century later, they are in use on the finest vehicles of land, sea and sky!

At the "Sesqui," Philadelphia

VALENTINE'S
VALSPAR
The Varnish That Won't Turn White



θ was obtained from the equation:

$$\theta = \tan^{-1} (L \sin \alpha - D \cos \alpha)/(L \cos \alpha + D \sin \alpha)$$

with L/D taken as the L/D of the Aeromarine No. 2-A, where its C_1 equals the K_1 of the Edo wing, the Aeromarine No. 2-A being the basis of design for the Edo wing.

The distribution of loads along the chord was arranged for high and low speeds, corresponding to typical aerodynamic pressure curves obtained from the wind tunnel tests. In the low incidence condition, since no uploads could be applied during static test, the loads were applied only in the rear of that point where the sum of the upward and downward air pressures was equal to zero. The character of loading along the span was likewise in agreement with the pressure distribution curves.

The wing was set up in the inverted position, at an angle of inclination as calculated by the above formulæ, and with a negative dihedral of some five or six degrees to take care of the deflection. The hinge points of the wing and the points of attachment of the bracing struts were abutted and attached to the walls of the laboratory in a manner simulating actual structural conditions. Jacks were placed under the points of the wing, these points being at junctions of the compression or torque tubes with the spars. Since the test panel was not covered, thin wooden strips were placed across the ribs to support the bags of iron filings used as load.

Low Incidence Test

The first load applied was of three factors. There was excessive bending in the ribs aft of the rear spar. The load was increased to four and a half factors, with increased deflection in the ribs at the trailing edge. One rib at about ten feet from the root of the wing broke at the rear auxiliary spar, at its upper cap strip, and the others in that region were dangerously bent where they were attached to the rear auxiliary spar.

The load was removed, and the ribs at the compression tubes were reinforced with two light strips of wood, 1 in. by 3/16 in., from lower rear spar to upper rear auxiliary spar, secured with glue and nails.

The load was further increased to six and a half factors. The trailing edge supported the load for about one and a half minutes. Then the reinforcements began to loosen, and supports were placed underneath the trailing edge to relieve the load if excessive bending in the ribs took place. However, when the jacks were lowered, these supports proved to be too high, so that the trailing edge prematurely landed on them. This set up extra stresses in the ribs, breaking one at the rear spar, and as soon as one broke, all of the rest immediately broke, breaking off the entire trailing edge aft of the rear spar. This probably would have happened even if the trailing edge had not landed on the supports, insomuch as the glued supports were giving way. With the reinforcements attached in a proper manner, the ribs can stand more than the 6½ factors. That this is the case was shown by a special rib test conducted on the rib testing machine of the Daniel Guggenheim School, which stood up to a factor of 10 at the low incidence condition.

As seen from the deflection diagram for the low incidence condition in Fig. 7, the difference in the deflections of the front and rear spars is not large, considering the concentrated character of the loading on the rear spar.

Before the panel could be further tested, for the low speed condition, boards were placed chordwise across the spars, in order that the proper chord distribution might be obtained in loading. This was satisfactory, since the maximum rib stresses come in the low incidence condition, where so much of the load is aft of the rear spar.

High Incidence Test

For the high incidence condition, loads corresponding to 4½, 6, 8, 9 and 10 factors were applied.

At nine loads, after three and a half minutes, a very slight bending was noticed at the bolt in a bearing plate at the strut attachment to the forward spar, but this was not of a serious nature.

At ten loads, soon after the jacks began to be lowered, a noise was heard at the strut at the point of attachment to the hull. The wing gave considerably, and settled on the jacks. Upon examination a fracture was observed in the hull strut in the vicinity of the bolt hole and another through the outer shell of the strut, along the bolt line. These breaks were in the outside walls of the tube, no failures being found inside on the main gusset plate, which was designed to take most of the load. This construction is shown in Fig. 8.

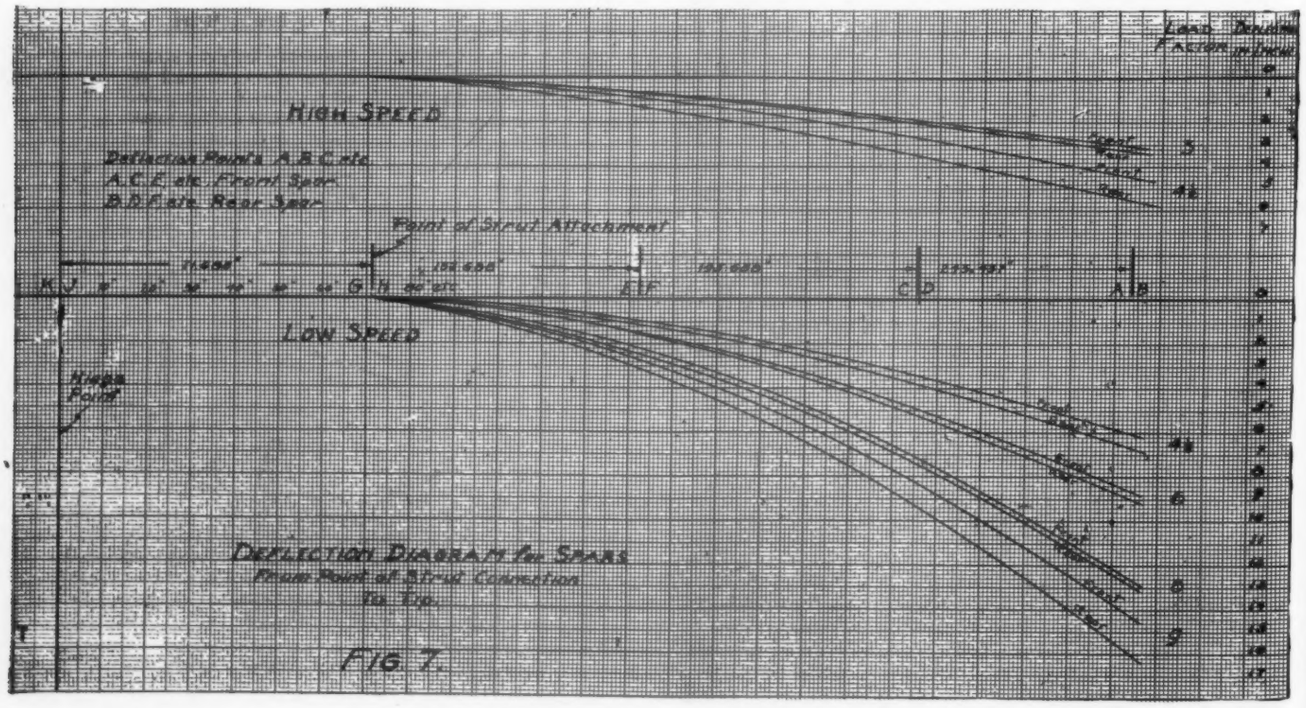


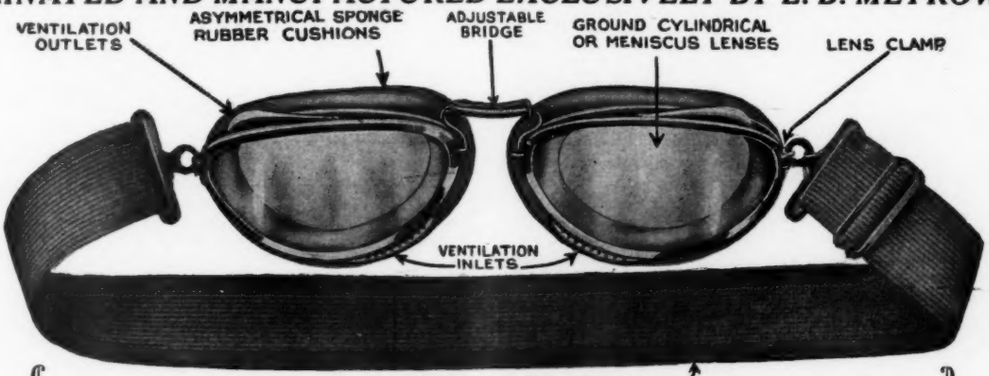
Fig. 7. Wing Deflection Diagrams

Meyrowitz Luxor Goggles are worn by America's best known pilots

"Casey" Jones at the finish of the Free-for-all race at the National Air Races, Sept. 4th, which he won with his Curtiss "Oriole" flying at an average speed of 136.11 miles an hour around a 12-mile course 5 laps, a total of 60 miles. "Casey" Jones is one of the best known airmen in the United States—a typical American commercial pilot. He wears the

NUMBER 6 U. S. AIR SERVICE MODEL

ORIGINATED AND MANUFACTURED EXCLUSIVELY BY E. B. MEYROWITZ



U. S. Air Service Model 6

With ground polished and cylindrically bent white lenses $10.75
With ground polished and cylindrically bent amber and euphos (green) tinted lenses 12.75
With hand ground meniscus or cylindrical white lenses 15.00
With hand ground meniscus or cylindrical amber or euphos tinfed lenses . 16.50

LUXOR Goggles No. 6

(Regular Model)

With good quality white lenses $9.75
With good quality tinted amber or euphos (green) lenses 10.50

LUXOR Goggles No. 5

With good quality white lenses $6.75
With good quality tinted amber or euphos (green) lenses 7.50

Write for Descriptive Circular

E. B. Meyrowitz INCORPORATED

Established 1875

Contractors to the U. S. Government

Paris
London
Detroit
St. Paul
Minneapolis

520 Fifth Avenue at 43rd Street, New York City

$W = (L \cos \alpha - D \sin \alpha)/\theta$

where

$L = n\ (Wg - Ww) - Ww$

n being load factor

Wg, gross weight of plane

Ww, weight of wing panel

α = angle of attack

θ = angle of inclination of wing to horizontal during sand test.

Upon further examination, it was found that the front strut terminal at the spar had completely failed. It is hard to say whether this or the other end failed first, but it seems logical that the hull connection must have broken first, since if the spar connection had gone first, the load would have been relieved by the wing settling on the jacks to some extent. This failure was complete, extending through both weld and solid metal.

Upon still further examination, a buckling in the upper flanges of the forward spar, Fig. 9, in the fourth drag bay from the hull was noticed. If this failure had come inboard of the strut connection on the spar, where the compression loads in the spar are highest, it might readily be considered as a direct compression failure of the spar. Insomuch as the failure was where the compression loads were relatively low, it is safe to say that the failure was caused by the sudden jolt the spar experienced when it landed on the jacks after the strut had failed.

Recording of Deflections

Deflections were recorded after the loads 6 and 8 factors were removed. These deflections lay on a straight line for all points at which readings were taken, so it was safe to assume that there was no permanent set in the spar structure, the deflection being undoubtedly due to slight yielding in the rigging holding the panel in position.

In Fig. 7, deflections are plotted as calculated or measured from a line passing through the hinge pin and the strut connection. All consideration of the yielding in the wall supports is thus eliminated. It is really the deflections referred to this line that are of interest in the calculations of secondary stresses in the spar. It is worthy of note that the deflections for front and rear are almost identical in value; which is a clear indication of the torsion resisting properties of the wing.

General Conclusions

With the single reinforcement in the portion of the rib behind the rear spar, the strength of the wing should exceed by several factors the 6½ load factor for the low incidence condition stipulated by the designer.

The load factor of ten is more than ample for a machine of this type, as shown by the high incidence condition results.

Particularly in view of the fact that the load factors were based on the gross weight of the plane, with considerable overload, the structural properties of the wing may be considered as entirely satisfactory.

The design of the wing is particularly interesting from the point of view of elimination of unequal deflections between front and rear spar; and hence the elimination of twisting or torsion in the wing. It is also a matter of congratulation that such a result has been achieved without the use of multiple spars by the ingenious employment of torsion tubes.

Ryans on Colorado Airways Route

The Colorado Airways, Inc., of Denver, Colo., operators of Contract Air Mail Route No. 12, have recently received the first of six new Ryan monoplanes ordered, to be used in their mail, express and passenger service. A good example of the efficiency of this plane for such work was demonstrated when it was ferried from the Ryan factory at San Diego, Calif., to Denver, Colorado, via the Los Angeles-Salt Lake route in a total of 11 hr. flying time. This performance is remarkable when it is considered that this particular plane is only powered with the 150 Hispano Suiza engine. With this new equipment in service the main schedule is more easily maintained, even when the prevailing strong winds are encountered.

The Mono Sales Co., of Denver, have taken the Ryan agency in Colorado, and already have arranged to deliver two additional planes to private operators this month.

Underwood & Underwood

The Autogiro constructed for the British Air Ministry by A. V. Roe, the well-known aircraft manufacturer, for experimental purposes. The Autogiro has now been further developed and the aileron controls eliminated. When certain tests have been successfully carried out, it is proposed to build a big machine to carry passengers and driven by two Napier lion engines, totaling 900 hp.

The Mono Sales Co.

DENVER, COLORADO

Announce

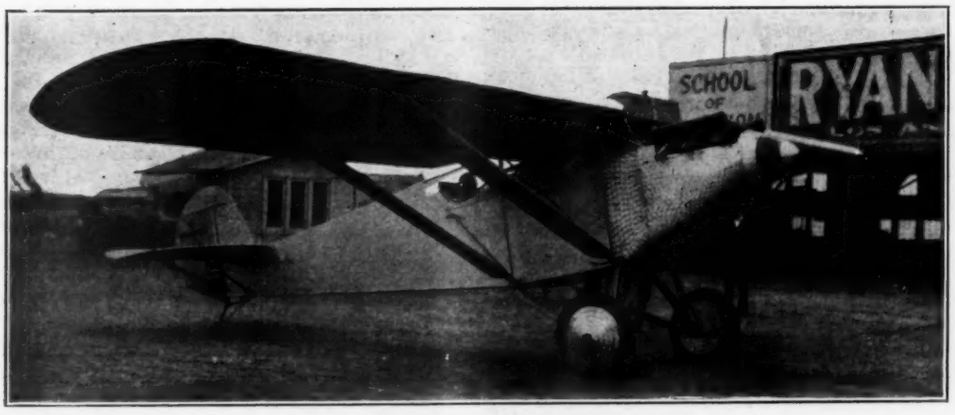
The selection of RYAN M-1 monoplanes *standard equipment* by C. A. M. No. 12,

"The Colorado Airways"

Now operating the contract airmail route over mountains of Wyoming and Colorado with every landing field over A MILE HIGH above sea level.

More and more, commercial airline and airmail operators voice their appreciation of this small, yet highly efficient commercial monoplane, by adopting it as standard equipment.

"Unusual economy per hour pound mile."



HISPANO-SUIZA

RYAN M-1

$3500 at

RYAN AIRLINES SAN DIEGO FACTORY.

Encouragement of Civil Aeronautics

The Department of Commerce Has Big Program for Fostering Civil Aviation.

SINCE THE signing of the Air Commerce Act of 1926 by President Coolidge on May 20, there has been much speculation as to what would be the outcome, direct or indirect, of this legislative measure. Much discussion has taken place on the correct interpretation of the numerous provisions of the Act in which, of course, the questions of regulation have been paramount. There is no doubt that even the Department of Commerce itself has been somewhat perplexed over some of the details of this new activity with which it has been endowed. The problem of encouraging civil aeronautics is not an easy one but Secretary Hoover's department has been working on its new field of industrial promotion work steadily since the civil aeronautics bill was passed by Congress.

Under the guidance of Assistant Secretary MacCracken, the Aeronautics Branch, Department of Commerce, has just issued a statement setting forth clearly and in detail the activities proposed under the new Act and the extent to which these activities will be carried in the immediate future. It must be recalled, of course, that while the Department of Commerce has been invested with the power to promote and encourage, regulate and coordinate commercial aeronautics, so far only the totally inadequate sum of $300,000 has been set aside by Congress for this gigantic purpose. It will, therefore, be impossible for the Commerce Department to do more than scratch the surface of any plan or system whereby to encourage and foster commercial aviation throughout the country.

Wide Field of Activity

Briefly, it is announced that the Department of Commerce will encourage the establishment of airports, airways and other air navigation facilities; study the possibilities of the development of air commerce, industry and trade; establish and maintain civil airways; operate and maintain between airports, landing fields, lights and other signal structures, and radio direction finding facilities; chart airways and publish air maps; recommend to the Secretary of Agriculture necessary meteorological service; collect and disseminate information relative to air commerce and the state of the art; advise with and transfer funds to other executive governmental agencies in research and development of air navigation facilities; investigate, record and publish causes of accidents; exchange with foreign governments civil air information.

In addition, the Department of Commerce will take over the airways and air navigation facilities now under jurisdiction of the Postmaster General (save airports and terminals, which may be transferred to the jurisdiction of the municipalities concerned).

Investigating Accidents

One of the most interesting items contained in this layout of activities of the Department of Commerce is that which concerns the investigation and publication of causes of accidents. While it is true that the wholesale publication of lengthy accounts of airplane accidents is a very adverse form of aeronautical publicity, there is little doubt that a great deal of good could be done by the careful investigation, by an impartial body, into the cause of certain accidents in civil flying and the publication, to the aeronautical community only, of the results of such investigations with recommendations for avoiding such accidents in the future. If the boundaries of a certain airport in municipal use constitute a hazard to airplanes taking off and landing on that field, than it is to the good of aviation to have this fact pointed out definitely, in order that changes may be made. Similarly, if, as a result of an accident, it is very definitely shown that a certain perhaps minor feature of an airplane is liable to failure, then, if this can be shown definitely by investigation, the manufacturers of the machine will be only too anxious to be able to announce that the matter has been looked into and the necessary changes in design made. It must be remembered, of course, that the question of a design being radically bad will never arise since an airplane of such design would not be flying in interstate commerce in view of the airworthiness requirements. It should be recalled that the Act provides for interstate and foreign commerce only and presumably, therefore, accidents to private aircraft, which, nine times out of ten, will be due to errors in piloting, will not be investigated by the Department of Commerce.

The statement continues, giving the regulatory powers invested in the Department of Commerce as:

> Registration of elegible aircraft; rating of such craft for airworthiness; examining and rating of the commander, pilot, mechanic or member of the crew engaged in the navigation of registered aircraft and the person in charge of inspection, overhaul or repair thereof; examination and rating of air navigation facilities available for the use of registered aircraft as to their suitability for such use; establishing air traffic rules.

Other Government Departments

In the matter of cooperation of other Government departments, it is now well known that the Weather Bureau of the Department of Agriculture is planning to furnish weather reports, forecasts and warnings to airports and, when radio facilities are available, to aircraft direct. The Secretary of the Treasury will designate ports of entry for foreign aircraft or American aircraft operating foreign services and arrange for customs inspection, etc.

At this time, it will be interesting to set down definitely for reference purposes, the present commercial aviation system in existence in the United States as a nucleus from which civil aviation is to grow under the encouragement of the Department of Commerce. In the first place, the Trans-Continental air mail route operated by the Post Office Department between New York and San Francisco needs no further mention than that it covers 2665 miles. The night service between New York and Chicago is also well known. This route is 770 miles long. There are fourteen other routes in active operation by private enterprise under contracts with the Post Office Department. Two more airways are expected to be in operation in the near future and still others are projected for early contract. There is also the Alaskan route operated in Winter only and one or two privately operated routes not, as yet, carrying mail. The following is a summary of these air services:

1. Boston-New York, 185 miles, Colonial Air Transport.
2. Chicago-St. Louis, 277 miles, Robertson Aircraft Corp.
3. Chicago-Dallas, 995 miles, National Air Transport.
4. Salt Lake City-Los Angeles, 589 miles, Western Air Express.
5. Pasco-Elko, 424 miles, Walter T. Varney.
6. Detroit-Cleveland, 91 miles, Ford Motor Co.
7. Detroit-Chicago, 278 miles, Ford Motor Co.
8. Seattle-Los Angeles, 1073 miles, Vern C. Gorst.
9. Chicago-Minneapolis-St. Paul, 384 miles, Northwest Airways, Inc.
10. Atlanta-Miami, 740 miles, Florida Airways Corp.
11. Cleveland-Pittsburgh, 115 miles, Clifford Ball.
12. Cheyenne-Pueblo, 200 miles, Colorado Airways.
13. Seattle-Victoria, 78 miles, Edward Hubbard.
14. New Orleans-Pilottown, 80 miles, Robertson Aircraft Corp.
15. Philadelphia-Norfolk, Phiadelphia Rapid Transit Air Service.
16. Detroit-Grand Rapids, 140 miles, Stout Air Services.

PROPOSED

15. Cleveland-Louisville, 342 miles.
17. New York-Atlanta, 819 miles.
18. Chicago-Louisville.
19. Louisville-Atlanta.

Passengers Also Carried

The majority of these services carry mail only. However, the Western Air Express, the Philadelphia Rapid Transit, the Florida Airways, the Stout Air Services, and the Northwest Airways, carry passengers. With a view to discovering the immediate outlets for expansion of these air services, the De-

THE

ADVANCE AIRCRAFT Co.

LARGEST PRODUCERS OF COMMERCIAL AIRCRAFT IN AMERICA ANNOUNCE

PRICE REDUCTION

ON THE IMPROVED

WACO-9

THREE-SEATER

$2250.

AT TROY, OHIO

More WACO'S are now in service for profit and pleasure than all other planes now in production in America.

THE PERFORMANCE MADE THE DEMAND

Write for Details

THE ADVANCE AIRCRAFT COMPANY

TROY, OHIO

partment of Commerce is conducting a survey of air transportation with particular reference to the existing commercial carriers. At present, all these contract air mail services are operated in daylight hours with the exception of certain sections of the Pacific Air Transport route which has been opened within the past few weeks. The economical use of the airplane demands that flying be carried out over these and other routes by night as well as by day and it is the purpose of the Department of Commerce to furnish to air traffic those aids which will result in the greatest degree of efficiency.

To Light Airways First

The Department of Commerce looks upon the lighting of the airways as the most urgent of the aids to be provided for the encouragement of commercial flying. The development of a system of weather report communication between, at first, those stations at which airplanes regularly alight, is considered of next importance, with the provision of radio beacons and radio markers next and, finally, when aircraft themselves are equipped with radio apparatus, the direct communication with airplanes in flight, providing weather information and other data.

It is planned to install as soon as possible, aerial lighthouses with revolving beams along all the airways and, where the terrain is particularly mountainous or rough, "blinkers" will be placed between beacons at every few miles. For the calendar year 1926 it is proposed to light approximately 1,287 miles of the 7,434 miles of unlighted airways, it being totally impossible for the Department of Commerce, on the small amount of money now available, to provide lighting facilities on all the airways or to furnish radio or any other navigational aid.

The lighting program promises installation of 24 in. revolving searchlights at intervals of 10 miles along those portions only of existing routes on which the present schedule demands flying in the dark of early morning and evening. The only exception to this 10 mile program will be the ends of each route and intermediate airports. The first light will be placed at 20 miles from the terminal and the second light at 40 miles; thereafter, at 10 mile intervals. In the center 10 miles of each of these 20 miles intervals, there will be placed four gas blinkers. This combination near the terminals will offer an opportunity for comparison in various weathers. Another consideration which suggests the reduction of the number of electric lights is the fact that the illumination of a city is visible at a considerable distance. At the intermediate airport cities, the standard lights are being placed at 10 miles either side, skipping the airport itself.

Routes to be Lighted

The 1287 miles of lighting to be provided this year is divided over seven of the air mail routes as follows:

		Total Miles	*Lighting Miles*
1.	New York-Boston	185	185
2.	St. Louis-Chicago	277	277
3.	Dallas-Chicago	995	345
4.	Salt Lake City-Los Angeles	589	140
5.	Pasco-Elko	424	100
9.	Chicago-Minneapolis-St. Paul	384	80
12.	Cheyenne-Pueblo	200	160
		3054	1287

At intervals of approximately 30 miles, lighted intermediate fields are being located. These are leased from their owners and only such crops will be grown thereon as will not seriously hinder landing or take-off. The boundaries of each field will be indicated by weather proof 25 watt electric bulbs connected with local lines or operated by farm lighting sets. The standard beacon light will be placed at every intermediate field. Every endeavor is being made to complete this partial lighting of the seven airways already enumerated before the dark days of the fall set in. Contracts have been let for 24 in. revolving lights, towers, generating sets, wind cones and other equipment. Survey pilots have started or completed surveys on the seven routes being partially lighted. These survey pilots fly the routes, locate sites for the 24 in. lights and for the boundary lighted intermediate fields.

It is planned to install the directive radio beacon on airways during the next fiscal year. In order that some experience may be obtained in the working of the radio beacon on a commercial airway, a demonstration radio beacon is being installed at the College Park Field of Washington, D. C. on the route of the proposed New York-Atlanta airway now being used by the P.R.T. air service from Philadelphia to Norfolk, Va. It appears to be the plan of the Department of Commerce to use the College Park Field as a sort of full-scale laboratory for the testing out of aids to air navigation, for it is proposed to experiment also on means of landing airplanes in fog, the radio beacon indicator and new lights, etc. This is probably a very good plan for there is little doubt that much development work can be done before the time actually to install certain of these "aids" arrives.

Generally, the radio beacon towers will be located at 200 mile intervals along the airways, at the airports, probably, sending along the airway behind and ahead a "beam"—probably a never-ending series of dashes, heard by the pilot. Off the course to the right, the pilot finds the dashes changed to dash and dot, the letter "N" in Morse, and he heads his plane until he hears again the steady dash. Off the course to the left he hears dot and dash, "A", and he corrects his course accordingly. In between these radio beacons, on the intermediate fields every 30 miles or so, will be little automatic radio "markets" transmitting signals to tell the pilot where he is along the route.

Weather Service

From many standpoints, the most important "aid" shortly to be provided by the Commerce Department is that which is becoming known as "weather service" though this does not by any means indicate that the Washington people will be in a position to serve any type of weather called for. Under this term "weather service", the Weather Bureau will establish (and has already gone a long way towards doing so) twenty-two new "upper air" stations along the airways. By telephone or telegraph, pilots engaged in interstate commerce (and presumably private fliers are also included) will be informed of weather conditions in those sections to be flown over and will receive forecasts several hours ahead.

The present and immediately proposed airways and the Trans-Continental Government lines are being served this year by a net of 50 Weather Bureau offices, (regular) and 27 Weather Bureau and 1 Signal Corps upper air stations, distributed along the airways now in operation or to be established by the end of the year. In addition, there are numerous other weather forecast stations operated by both the Signal Corps and the Navy which will cooperate in the airway program.

Where there is an upper air office at an airport, the upper air and flying weather reports will be forwarded by the upper air observer working in conjunction with the local airport and Weather Bureau offices, to the adjacent airport office where it may be required, at times sufficiently prior to the departure of planes. (Example—Kansas City will transmit upper air and flying weather to Wichita or Moline, as necessary).

Where there is a regular Weather Bureau office and no upper air office at an airport, the regular Weather Bureau office, in conjunction with the local airport office, will, upon request, forward a report of local flying weather conditions to either adjacent airport, where required, at times sufficiently prior to departure of planes. (Example—Hartford Weather Bureau office will transmit flying weather to Boston or Hadley Field, as necessary.)

When weather observations are taken at special places, such as intermediate fields where there is neither a regular Weather Bureau office nor upper air observer, the special observer, who may be the caretaker, will upon request forward the flying weather report to the adjacent airport, as required, at times sufficiently prior to the departure of planes. (Example—Tejon Pass will be asked for weather report by Los Angeles).

It is hoped that eventually it will be possible to institute a ground system of communication between airports along which not only weather reports will be transmitted but also reports of arrivals and departures of airplanes and other

Consolidated Airplanes Wear Well

Quality is first in their design and manufacture
Up-keep, ordinarily a serious problem is almost nil

Trade Mark *Copyrighted*

Only American manufacturers specializing in training airplanes
Five years continuous development on one basic design
Safest training and sportsmen's airplanes ever flown

Contractors to United States Army and Navy

CONSOLIDATED AIRCRAFT CORPORATION

Buffalo, New York

details and information in the organization of the commercial airway system.

The establishment of airports themselves does not come into the work of the Assistant Secretary of Commerce for Aeronautics, except in the matter of emergency landing fields. It would seem that in the long run even the latter will not remain under the jurisdiction of the Commerce Department for very long since there is little doubt that the town which is almost bound to be close to an emergency field created by the Department of Commerce will eventually become sufficiently interested in attracting air services, to be anxious to control its own municipal flying field.

Problems in Designating Airways

The activities of the Department of Commerce in lighting all airways created by interstate commerce operations will, however, call for careful consideration from time to time, as is no doubt already realized. For instance, it is now fairly well known that in the question of contract air mail routes, there are cases in which the Postmaster General has been, in effect, forced into the advertising of services which he knew well would not be sound mail carrying propositions, his experience and knowledge of the class of mail handled in the ordinary way at cities along such routes indicating that there would be little or no air mail forthcoming. However, when a municipality definitely requests that it be placed upon the air map and asserts that it will provide air mail, there is little else that the Post Office Department can do but to advertise that route and, in the event of a satisfactory bid being put up, to let the contract. The Post Office Department cannot, of course, be held responsible for the lean time afterwards experienced perhaps by the contractor. But when the Department of Commerce steps in to provide its "aids", then careful discretion and investigation will become necessary in order to avoid the resultant waste and false propaganda which would be created were a totally non-productive airway elaborately lighted.

It may be presumed, however, that the Department of Commerce is fully aware of these things and there is no doubt that the Aeronautics Branch is making full use of the expert advice and opinion which is now available. There is no doubt that the problem is being tackled carefully and with a thought to all sides of the numerous questions involved. All that will be necessary is additional funds from Congress in order that the Department of Commerce may set to work to provide real "aids" to air navigation as soon as possible.

Vienna—Venice Air Line

On Aug. 12 the Vienna-Venice air line, the first to connect Italy and Austria, began operations. Italy has promised a subsidy of 10 lira for flying a kilometer, or approximately $50,000. per year. The Austrian Air Travel Company, which operated last year from Vienna to Klagenfurt, near the Italian frontier, endeavored to obtain a subsidy from the Austrian Government, but because of the state of finances in that country, the project was abandoned, which left the opportunity for the perfecting of this venture. An understanding was reached, which will give Austria the right to resume control over its section of the route when a subsidy is available. Italian pilots are to be used, with an Austrian personnel in the airdrome in Vienna.

German Aviation Shows Marked Progress

In 1925, 56 regular air lines were operating in Germany, serving an area of 23,000 kilometers and touching at 61 cities, according to a report from the Department of Commerce. At the end of 1924, only 12 lines were operating over an area of 7,146 kilometers and touching at 26 towns.

A total of 107,544 seats were available in 1925, 55,185 of which were occupied. Of the 24,613 seats available for passengers in 1924, 13,422 were occupied. In 1925 1,016,600 kilograms of postal goods, freight, and baggage were carried compared with 202,806 kilograms in 1924. The total distance flown in 1925 was 7,534,756 kilometers while during the previous year the distance was slightly more than 2,000,000 kilometers.

French Student-Aviators' Training

In a report to the Department of Commerce, Trade Commissioner Kelley, at Paris states that six months' training and $1,000 are required for an airplane pilot's license in France. A private company operating a training school near Paris, which has been in existence since 1912, charges tuition of 33,000 francs, approximately $1,000 in July, which tuition does not include board and lodging. Four months is allowed for theoretical training and two for practical work with planes. Four hours taxiing, 8 hours flying with an instructor, and about 30 hours solo flying are the requisites for a civilian pilot's license, with an additional 10 hours flying for a military license.

To Establish Air Line in Brazil

According to a report just received by the Department of Commerce from Consul General A. Gaulin at Rio de Janeiro, the Governor of the State of Minas Geraes, Brazil, has placed a call for tenders for the establishment of an air transport service between Bello Horizonte and Rio de Janeiro with intermediate stops at Queluz, Barbacena, and Juis de Fora. The report said the following firms have presented bids: the Companhia Nacional da Navegacao Aerea, L. Figueira e Cia., Cardosa Barins Cia., and the Junkers Corporation of North America.

Charley Grey

Editor of the Aeroplane, the aeronautical colossus whose pen and camera arouse and amuse airminded people on both sides of the Atlantic.

A Prophecy—

The Star in the Sky

Whether on the wing of a mail plane, a bomber, a naval reconnaissance plane or a commercial carrier, the tri-color star of The Glenn L. Martin Company holds the same significance to the experienced observer—*engineering supremacy—fine workmanship and unremitting care—experience dating back to the infancy of the art seventeen years ago*—DEPENDABILITY.

AS the years go on, the *maker's name* will carry a more potent significance as applied to airplanes than as applied to any other manufactured commodity.

The Cole Sport Commercial Airplane

A New Two-Seater Commercial Plane with an OX-5 Engine.

THE COLE Aircraft Corporation of Cleveland, Ohio, manufacturers of commercial aircraft, has recently produced an interesting airplane of comparatively low horsepower, which, for a stock commercial job, has a notable high speed combined with a quick take-off and a slow landing speed. This machine has been named the Cole Sport Commercial.

Realizing the need for a fast commercial plane, one with a high cruising speed, yet low in initial cost and maintenance, the Cole Aircraft Corporation set to work to develop an airplane along these lines. The machine produced has proved a marked success. The design and construction of the plane follows the latest practices of the present time. The production model is powered with the Curtiss OX-5 engine and is one of the fastest new production, stock commercial, OX-5 machines on the market to-day. Furthermore, a valuable point in the design of the plane is that, either the Hispano-Suiza or Wright Whirlwind may be employed, provision being made for the change.

The machine is a tandem two-seater single bay biplane. The cockpits are extremely roomy and have ample leg room. They are so arranged that excellent vision is possible from either cockpit. The sides of both the passengers' and pilot's cockpit are upholstered with leather as well as the edges of the openings. Wind shields are of Dupont's Pyralin and completely protect the passenger and pilot from the slipstream. The plane is covered with fabric, the color scheme being optional.

Steel Fuselage

The fuselage is built entirely of welded seamless steel tubing, braced with tubing from the stern post forward. Fuselage fairing is of light spruce strips, the turtle being of the same construction. The engine mounting is detachable by removing four bolts, thus a change of engines can be made in a comparatively short time. The cowling is formed of aluminum and is of a quickly detachable type, allowing quick access to the engines and its accessories.

The wings are of conventional design, built entirely of spruce and having laminated spars. Both laminations are routed inside between bolt holes, forming a very strong box spar. The compression webs are solid and reinforced with spruce strips on both sides. The trailing edges of the wings are formed of ¼ in. aluminum tubing. The internal bracing is No. 9 steel wire. The walk on the lower wing is of 3/16 in. plywood and extends from the entering edge to the trailing edge of the wing. Ailerons are placed on both the top and bottom wings, and the plane is extremely easy and sensitive on the lateral control. The ailerons are operated by cables placed in the bottom wing only. This facilitates quick replacement of cables as well as ease of inspection.

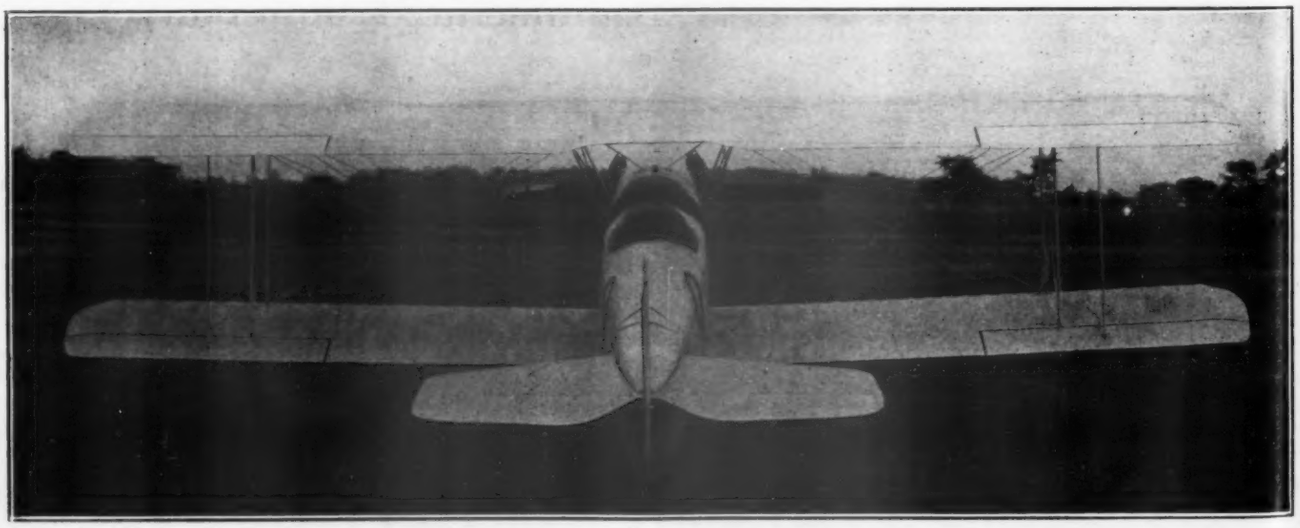
Controls

The tail surfaces are of steel tube construction. There are two separate elevator masts, both being completely housed in the fuselage. The elevators are actuated by a seamless steel tube connected directly to the control stick, making the elevator action absolutely positive. The rudder is controlled by cables attached directly to the rudder bar. All control cables and tubes are completely housed in the fuselage. The undercarriage, which has a wide tread is constructed of steel tubing, streamlined, and is the divided axle type.

Characteristics and Performance

The chief dimensions and the manufacturer's performance figures of the Cole Sport Commercial fitted with the OX-5 engine, are as follows:

Span, both wings	27 ft.
Chord, both wings	4 ft.
Gap at center	4 ft. 2 in.
Stagger	1 ft. 8 in.
Incidence, upper wing	0 deg.
Incidence, lower wing	1½ deg.
Dihedral, upper wing	½ deg.
Dihedral, lower wing	1½ deg.
Length overall	21 ft.
Height	7 ft. 7 in.
Area of horizontal tail surfaces	29 sq. ft.
Area of vertical tail surfaces	10 sq. ft.
Area of ailerons	24 sq. ft.
Weight empty	1,050 lb.
Useful load	600 lb.
Wing loading	8⅓ lb.
Power loading	17½ lb.
Fuel capacity	32 gal.
Endurance, at cruising speed	4 hr.
Maximum speed	120 m.p.h.
Landing speed	45 m.p.h.
Climb to 1000 ft.	1 min. 57 sec.

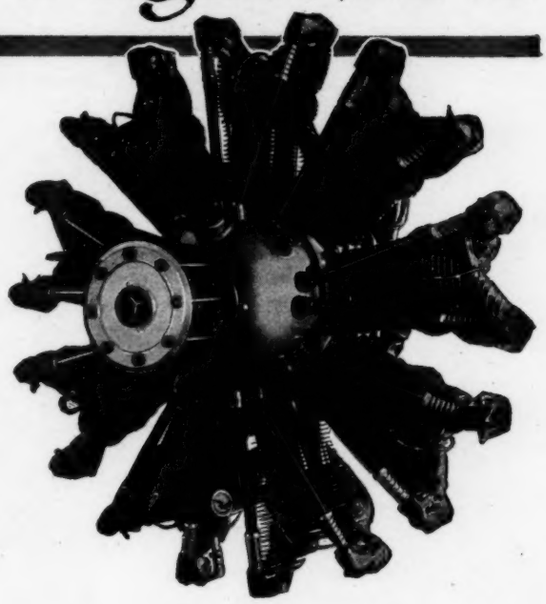


The Cole Sport Commercial two-seater (Curtiss OX-5)

Air Cooled Fighters

"Wasp" leadership, established through improvement in basic design, has resulted in a new and broader application for radial air cooled engines.

These unusual qualities coupled with Pratt & Whitney's unexcelled workmanship make for the fine performance and dependability so vital in both military and commercial flying.



THE WASP
425 H.P. at 1900 R.P.M.
Weight 650 lbs.

Wasp Engines are now flying in these Navy Fighters

THE CURTISS HAWK

THE BOEING FIGHTER

THE WRIGHT APACHE

PRATT & WHITNEY U.S.A. DEPENDABLE ENGINES

THE
PRATT & WHITNEY AIRCRAFT CO.
HARTFORD CONNECTICUT

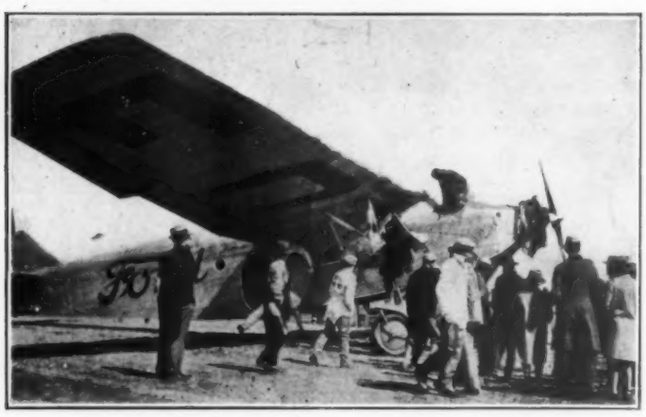
Cornerstone of Buffalo Airport Laid

By G. Graham Davidson

Although the weather interfered with part of the program, which had been planned for the laying of the cornerstone of Buffalo's new airport, Sept. 25, several hundred spectators braved the storm and witnessed the laying of the stone in a tent. The Rt. Rev. William Turner, bishop of Buffalo, opened the ceremony with an invocation and a eulogy of the pioneers of aviation. In the temporary absence of Mayor Frank X. Schwab, Major John M. Satterfield, a prime mover in the establishment of the airport, took charge. The 28th Infantry Band, from Fort Niagara, had charge of the musical portion of the program. W. Irving Glover, Second Lieutenant Postmaster General in charge of Aviation, delivered a short address.

It is natural that Buffalo should take up the airport problem, as it has been active in aircraft manufacturing for many years. Thousands of airplanes were built there during the war, and Buffalo is the home of the Curtiss Aeroplane & Motor Co. production plant, the Consolidated Aircraft Corporation, the G. Elias Airplane Co., the Irwin Parachute Co., and the Eberhart Airplane Co.

During and immediately following the war, Curtiss Field, located north of the city, served the purpose of training pilots



Ford 3-Engine Transport at opening of Buffalo airport

and testing planes, but there developed a steadily increasing demand for more complete flying field facilities. The Aero Club of Buffalo, which by this time was composed largely of former air service pilots, became interested and devoted its valuable efforts to the locating and acquiring by the city of a suitable airport site.

In 1922 and 1923 various prospective airport sites were advocated by the Aero Club, the Buffalo Chamber of Commerce and other organizations. One was approved by Major General Mason M. Patrick for an air service reserve station and airport. The thought of developing Curtiss Field was abandoned as its size was limited and drainage poor. A thorough study was then made of present and future requirements and those interested in the problem became familiar with similar developments in other cities. With this information, the Buffalo Chamber of Commerce undertook in 1925 an intensive investigation of suitable airport sites in the vicinity of the City. Three were recommended and one was approved by the City Council. This site, owned by the Buffalo Trap and Gun Club, consisted of 185 acres. This and 330 acres of adjoining land was purchased, and two appropriations totaling $425,000 were made. Additional appropriations were made for the improvement of the property, amounting to about $250,000. The airport is under the Department of Parks and Public Buildings and all expenditures and improvements made by the city are under the supervision of this department. The airport is therefore municipally owned, developed and operated. Hangar space and land for building purposes are to be rented to air service and airline operators, private owners and manufacturers. The City Council selected Lieutenant E. M. Moore, former air service pilot and manager of Curtiss Field, as manager of the airport.

Work was started on the field May 3, 1926 and it has been in constant use ever since. Buffalo Airport is located just east of the city, about two and a half miles from the city line and eight miles from the center of the business district, the post office and railroad station, with which it is directly connected by Genesee St. It is connected by a concrete highway with all main roads leading out of the city. It is bordered on one side by the Lehigh Valley Railroad and the New York Central main line.

The airport is of irregular shape, approximately a mile square. It is on high, flat ground, having a gentle slope, which, together with the complete pipe drainage system, which has been installed, assures adequate drainage. There are two main cinder runways, one in an east and west direction and the other in a northeast and southeast direction, each being 2500x100 ft. These are approximately in the direction of the prevailing winds. Other runways are being constructed and are expected to be completed in the spring of 1927.

Three hangars have been constructed, two of which are 65x80 ft., and the third one 80x100 ft. These are of steel, brick and glass construction, giving the best possible daylight conditions inside. The concrete floors slope toward a submerged drain, extending along the front of each hangar. A completely equipped garage and shop are also finished and fire apparatus has been installed. A special gasoline supply truck, equipped with four five-gallon Foamite fire extinguishers, is used for refueling on the field. There are also first aid rooms, and the administration building, which commands a full view of the field, is under construction.

Byrd Plane Making Long Tour

The Guggenheim Foundation has financed one of the longest tours ever undertaken by a commercial airplane in this country.

During October the Fokker plane, which Comdr. Richard E. Byrd flew to the North Pole from Spitzbergen, will start on a tour which it is expected will cover about 7,000 miles in six weeks. The tour is sponsored by the Department of Commerce and is being undertaken with the idea of interesting the public in commercial aviation and airport facilities. The plane will be piloted by Floyd Bennett, Comdr. Byrd's pilot on the Polar Flight, and by Lieut. Brent Balchen, formerly of the Norwegian Navy, whose cooperation at Spitzbergen was of great value to Comdr. Byrd.

The Fokker monoplane is now being repainted at the Fokker Aircraft Company's plant at Hasbrouck Heights, N. J. The cabin is also being decorated and made comfortable for passenger flying. The three Wright Whirlwind engines have been recently reconditioned and are considered practically as good as new. Besides the two pilots Thomas Kinkaid, the Wright chief mechanic, who had charge of the engines at Spitzbergen, will go along.

The plane started from Washington, D.C., on October 7, and flew to New York, with Assistant Secretary of War, F. Trubee Davison, Assistant Secretary of Navy, Edward P. Warner and Assistant Secretary of Commerce, Wm. P. Mac Cracken, Jr.

D. B. Colyer, to be New Air Mail Superintendent

Postmaster General New has announced the acceptance of the resignation of Stephen A. Cisler, of Denver, Colo., general superintendent, Air Mail Service, which became effective Oct. 1. Mr. Cisler is to become traffic manager for Sears-Roebuck Co., Chicago.

At the same time the Postmaster General announced the appointment of D. B. Colyer, of Bement, Ill., then assistant general superintendent, Air Mail Service, to succeed Mr. Cisler. Alvin E. Peterson, of New York City, now assistant superintendent for Contract Air Mail Service, will fill the vacancy caused by the elevation of Mr. Colyer as assistant general superintendent of the Air Mail Service.

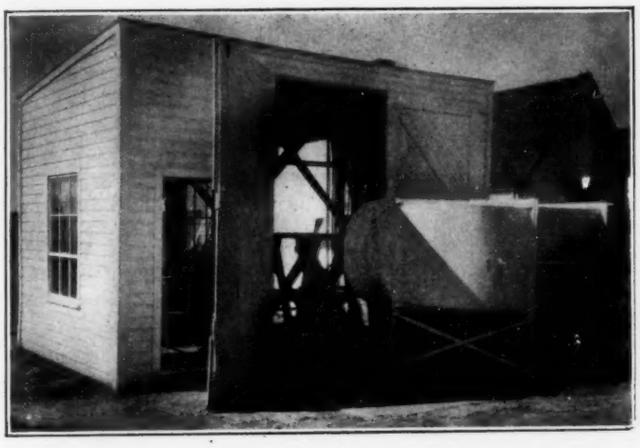
Motor Test House at Pitcairn Factory

The need for a convenient and inexpensive test stand for aero engines has led to the construction of a combined shelter and wind tunnel at the Pitcairn factory at Bryn Athyn. The main object was to construct a running-in stand so that the engine would operate under conditions similar to those prevailing in actual flight; at the same time permitting observations to be made and records taken comfortably and conveniently. The latter is very important if the records are to be of any value.

While no provision is at present made for recording the horsepower of engines tested, calibrated propellers or those of known characteristics are used. Fuel is measured by a Brown-Barlow flowmeter placed in the observer's office, together with the other suitable instruments and controls. Although air-cooled engines will be principally tested, the stand accommodates other types including the Curtiss C-6 and OX-5, and provision is made for a water tank over the office. Air-cooled engine testing can be conducted either with the doors wide open and self-induced air stream only, or this can be supplemented by a very convenient form of return flow air stream which we believe to be original. This is obtained through a return air tunnel of rectangular section outside one wall of the building, connected at each end by bends having a three foot diameter circular opening. Air from the slipstream is thus returned to the front of the engine and concentrated on a three foot diameter center disc area opposite the engine. By manipulating the doors, this disc can be the total air stream or simply a supplemental one striking the engine.

The air flow in the bends in the tunnel is deflected by suitable internal wooden members. The observing office is completely enclosed from air currents and eddies. Windows are screened by heavy mesh wire, and at the propeller end of the test house are installed three 10 ft. sliding gates, which give free access to the propeller for swinging when starting. The sides of the house are of 2 in. thick lumber; boiler plate 2 ft. wide is fixed to the sides opposite the propeller. The stand rests on a solid concrete block 2 ft. thick and the walls on blocks 2 ft. from the ground. The roof joists support a central steel girder on which runs a travelling chain hoist; the girder extends four feet over the rear wall to provide convenient loading and unloading of engines.

The device, which is proving most successful, was designed by Robert W. A. Brewer, engineer for Pitcairn Aviation, Inc.



The Pitcairn Motor Test House. The engine test house and wind tunnel at the Pitcairn factory. At the left is the observer's office, with desk and instrument board. One half door is opened to show the engine stand; the bend of tunnel, which is movable, is in place for the return of slipstream to the front of the engine. The tunnel walls are corrugated iron to provide a large cooling surface for the air current.

NEW STANDARD J. I. AIRPLANES

SET UP, TEST FLOWN, READY TO FLY AWAY

Come and take your pick.

New Clipped wing Standards with used OX5 motors installed	$800.00
New Clipped wing Standards with Government overhauled OX5 motors installed	900.00
New Clipped wing Standards with new OX5 motors installed	1200.00
New Clipped wing Standards with 150 H.P. Hisso motors installed	1500.00
New Regular size Standard J.I. Airplanes with Govt overhauled OX5 motors installed	900.00
New Regular size Standard J.I. Airplanes with new OX5 motors installed	1200.00
New Regular size Standard J.I. Airplanes with 150 H.P. Hisso motors installed	1500.00
Used Standard J.I. Airplanes	$650.00 to $750.00
Reconditioned JN4D airplane, practically new OX5 motor installed	650.00

Our warehouses are full of Standard airplanes and parts, as well as parts for every make of plane and motor.

Our policy is "Satisfaction or money refunded"

We guarantee our prices to be lower than any other dealer in the country—
Give us a trial, and be convinced.

ROBERTSON AIRCRAFT CORPORATION

OPERATORS OF ST. LOUIS-CHICAGO UNITED STATES AIR MAIL

LAMBERT-ST. LOUIS FLYING FIELD, ANGLUM, MO.

Side Slips

By Robert R. Osborn

Much comment has been aroused in the newspapers because the challenger, now the champion, in the heavy-weight boxing class, saw fit to fly to the fight in Philadelphia with "Casey" Jones. As we remarked when a similar flight at the beginning of the training period was prevented by Richard, the promoter, opinions differ as to what is, and is not, dangerous. If we had been in the plane, and were being taken to Philadelphia to step into the same ring with Dempsey, the greatest possible risk would have been in landing safely. We probably would have been hoping, possibly praying, that the ship would "crack up".

* * *

During this Dempsey-Tunney fight there were some planes flying pretty close overhead, for either photographic or gate-crashing purposes. Apparently this aroused some protests from the fight spectators, as the Director of the Philadelphia Department of Public Safety has requested the city council for funds with which to purchase two police planes, to prevent similar demonstrations in the future. It might be well to pass the word around, about these two police planes, to the boys who are still "gypsying" war stock planes about the country. We've seen some of these planes lately that would be very susceptible to arrest on a charge of "Vagrancy, Your Honor, and no visible means of support."

* * *

Lieutenant Doolittle's successful cross-country flights in South America, in spite of two broken ankles, are quite remarkable accomplishments. Flyers seem to have an inherent weakness, as a class, for sprained ankles and game legs. As was the case with Lieutenant Doolittle, most of these injuries seem to come from accidents outside of flying, such as falling downstairs or tripping overcurbstones. We remember one Sunday, at an eastern flying field, when the pilots unthinkingly left three pairs of crutches parked on the bench outside of the flying office—and wondered why such a good flying day should be the poorest of the season in the amount of business.

We wish we could have caught with a camera the expressions on the faces of a couple at the same field, when a mechanic brought two crutches out for the pilot of the machine in which they had just had their first flight.

* * *

Los Angeles is beginning to be a serious rival for Winsted, Connecticut in the business of supplying the newspapers with fearful and wonderful items for the front pages and the picture supplements. Winsted specializes in hens that lay a dozen eggs a day and cats that bark or smoke pipes, whereas Los Angeles seems to have become the aerial stunt center of the United States. If we remember correctly, among the recent accomplishments of the flyers of that district have been tennis games on the top wings of planes in flight, changing from racing cars to airplanes and other amusements of that type. The most recent story from this source is to the effect that when a machine lost a wheel in flight, a young lady changed to another machine, went down to the field and returned in the nick of time, with the wheel that saved her aged parents from being put out on the street by the sheriff and the villain—no, no. where were we? The wheel—we have it straight now, was placed on the damaged landing gear just in time to save the ship and occupants from "death and destruction".

We suppose that Los Angeles airplane mechanics have already reached the point where they think nothing of completely overhauling a motor or changing a propeller, in flight.

AERONAUTICAL SUPPLIES
ABOVE ALL
FIND IT HERE
This catalog and a new supplement present descriptions and prices of thousands of aeronautical items, hundreds of them illustrated.
Many of the articles listed are manufactured in our own plant, under rigid supervision. Everything offered has been carefully inspected.
Our factory has every facility to build airplanes in wood or metal. Whatever you need, if it's aeronautical, send to Supply Headquarters.
BE SURE TO HAVE OUR CATALOG HANDY
Johnson Airplane & Supply Company
DAYTON

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, of AVIATION published weekly at Highland, Ulster County, New York, for October 1, 1926.

State of New York
County of New York } ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared George Newbold, who, having been duly sworn according to law, deposes and says that he is the Business Manager of AVIATION and that the following is, to the best of his knowledge and belief, true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher, Gardner Publishing Company, Inc., Highland, New York; Editor, W. Laurence LePage, 225 Fourth Avenue, New York City; Managing Editor, none; Business Manager, George Newbold, 225 Fourth Avenue, New York City.

2. That the owner is: (If the publication is owned by an individual his name and address, or if owned by more than one individual the name and address of each, should be given below; if the publication is owned by a corporation the name of the corporation and the names and addresses of the stockholders owning or holding one per cent or more of the total amount of stock should be given.)
Gardner Publishing Company, Inc., Lester D. Gardner, 225 Fourth Avenue, New York City; Earl D. Osborn, 225 Fourth Avenue, New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of the total amount of bonds, mortgages, or other securities are:
Lester D. Gardner, The Gardner, Moffat Company, Inc.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

George Newbold, Business Manager.
Sworn to and subscribed before me this 5th day of October 1926.
[Seal.] FREDERICK C. ZIMMERLI
(My commission expires March 30, 1928.)

AIRPORTS AND AIRWAYS

Moline, Ill.

By W. B. Mueller

Floyd Kettner, one of Moline's pioneer aviators, has produced a monoplane of his own design, which he expects will fulfill all his ideals of what a good plane should be.

The new machine has a semi-cantilever wing, internally braced and externally supported by two struts on each side. The wing, built around strong wooden spars, is a high lift type with a very pronounced camber. It is bolted directly to the top of the fuselage, which is of the cabin type, affording closed and upholstered room for four passengers.

There is an open cockpit for the pilot back of the cabin. While an OX-5 engine has been installed in the machine for testing purposes, a more modern power plant, such as a Wright Whirlwind, would enable the plane to perform wonderfully. Provision has been made for easy substitution of a different engine because the supports can be removed readily by taking out four bolts. The gasoline tank is carried in the wing and feeds by gravity. Its capacity is 35 gal.

The plane is purely an experimental job and several changes may be made before it is put into production. In a very short testing period on Sept. 23, the plane showed astonishing lifting power and it climbed with remarkable ease. It could hardly carry four passengers at present, however, with the OX-5 engine.

The air mail business here is growing slowly but steadily. The public is awakening to the value of the airways as a means of quick transportation of mail. Not enough of the public, however, has begun to use it. Moline has a little corps of boosters who boost almost with the energy of fanatics. Addition of passenger service and express facilities will help both the company and Moline.

From the standpoint of sensationalism, the air mail is geting monotonous. The N.A.T. plane comes early in the morning from the East and arrives early in the evening from the West with unvarying regularity. Nothing worth talking about ever happens to the planes or pilots. They "zip" in and "zip" out again with an unjustly small amount of mail. The service is so reliable that we Moliners take it for granted, just like the freight train or motor bus.

At the request of the air mail division of the Post Office Department, the beacon and neon tubes at Moline airport were left lighted each evening during the week of Sept. 19 to 25. Pilots of the transcontinental mail, flying over Cordova, Ill., on the lighted airway, were supposed to make reports as to how the lights could be seen at their elevation, and whether the neon rays penetrated better than the white rays of the beacon.

Moonlit nights recently have been ideal for night trips and several of the boys have availed themselves of the fun of flying over these tri-cities in the moonshine, keeping the populace quite worked up and in a questioning mood.

Moline airport is a mighty popular place when weather is at all favorable. On Sundays and holidays and on week-day afternoons one can see Rusty Campbell and his associate pilots taking the gasping doubters or the trustful Modocks up

Alexander Eaglerock

(PERFORMANCE WITH ECONOMY)

Wins Again

R. A. Edwards wires September 26th from the World Flight Commemoration Meet, Clover Field, Santa Monica, California, as follows:

"Piloted by Paul Richter our Eaglerock beat all OX5 ships and won race on points from all other types. Covered one hundred thirty seven mile course in one hundred minutes flat including 5 four minute stops making our average near one hundred and fifteen miles per hour. Everyone very enthusiastic over Eaglerock."

We Sell the Eaglerock on a

TIME PAYMENT PLAN

DETAILS OF PLAN ON REQUEST

EAGLEROCK DEALERS

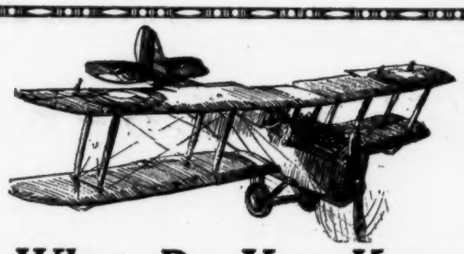
Southern California—Aero Corporation of California, Los Angeles
Northern California—W. L. Lamkin, Porterville, California
Michigan—Niles Airways, Niles, Michigan
Indiana—Captain J. A. Yonge, Gary, Indiana
Illinois—Sievert Aircraft Corp., Chicago
Oklahoma and Texas Panhandle–Tibbs Flying School, Oklahoma City
Virginia and North Carolina—J. S. Charles, Richmond, Virginia.
New Jersey and Delaware–Hill and Markham, Vineland, New Jersey

CASH PRICE—$2475—DENVER

ALEXANDER AIRCRAFT CO.

Associated with Alexander Industries

ROOM 401, ALEXANDER INDUSTRIES BLDG., DENVER, COLO.



What Do You Know About Airplanes?

A FEW years ago men had to learn about aircraft from personal, costly experience. They had no one to guide them—no one to point out mistakes when they were made—and therefore years were spent learning what takes months now.

THOROUGH — PRACTICAL TRAINING

Today the American School of Aviation offers you these long years of experience and knowledge, which cost millions to acquire, in their new and fascinating Home Study Course in Practical Aeronautics which has been highly endorsed by prominent aviation authorities.

WRITE TODAY

No matter whether you have worked with airplanes all your life or are just beginning in the industry you owe it to yourself to send for a complete and detailed outline of this training and our new and interesting free book, "Opportunities in the Airplane Industry."

American School of Aviation

Dept. 8257

3601 Michigan Ave., CHICAGO, ILL.

for long or short hauls and if Trusty Rusty gets the right kind of passenger, especially one having a free ride, he is quite likely to inject a few loops or a side-slip into the jaunt. Rusty has built up a wonderful business.

Let's give the Moline Daily Dispatch a little credit, incidentally, while telling how interested Moline is in aviation. The Dispatch sent a man on the 1925 Reliability Tour and wanted to send one on the 1926 Tour, but couldn't. In addition to that, the paper has been running a weekly aviation section telling in glaring headlines how safe it is to ride in airplanes. Sometimes the section occupies a full page and it is liberally illustrated with good pictures of aviation events from all parts of the earth. The articles are non-technical and meant to appeal only to the common reader. It also has boosted the air mail.

Alexander Makes Business Trip by Air

In a publicity tour, recently made by J. Don Alexander, president of the Alexander Aircraft Co., from Denver, Colo., to Spokane, Wash., via San Diego, Cal., during which 30 cities were visited, the flight mileage was 2,850, compared with 3,220 miles by auto roads and 3,351 miles by rail. The train time for the trip would have been 11.8 days. Auto time would have been 14 days while by air, flying time was 3¾ days.

Flying an Eaglerock, powered with a 90 hp. OX-5 engine, the pilots carried in excess of 700 lb. of load over the Rocky Mountains and through high country. The cruising speed was 85 m.p.h. The plane flew at various altitudes from sea level to 12,000 ft. above. The flight was made over 11 mountain ranges, and landings were made on 40 fields. One hundred and thirty-two flight demonstrations were made, 58 pilots and 110 passengers carried.

The total flight expenses, for two, including engine overhaul and incidental expenses, was only $168.00. The average automobile would cost $225.00 to drive over the same route and the train fare, for two, including Pullman charge, would be $322.00.

The route traveled was over some of the most sparsely inhabited portions of the West and, although only 10 per cent of the fields were organized airports, three of the total number visited were difficult for landing or taking off. The personal transportation cost from field to town was a total of $4.00.

New Airport at Schenectady, New York

By John J. Birch

A new aviation field has been established a few miles West of Schenectady, New York. An attracting feature to the field is the passenger flights under the direction of the Inter Cities Airway Service.

Victor A. Richard, chief pilot, has had eight years of flying experience. In 1918 he graduated from the Commercial Aviation School of Chicago and in 1919 entered the Aviation Section of the United States Navy. He was stationed at the Great Lakes Illinois Field engaged in machinist work on Government Planes. From there he went to Pensacola, Fla. for navy flying duty.

While in Flordia, he became interested in commercial aviation and since then has devoted his entire attention to such work, having flown from Texas to Schenectady in 1922. At that time such a flight was considered an unusual feat.

For his work at the Schenectady Field he is using a Standard J-1 plane, equipped with an OX-5 engine. Aside from this machine, he has a Thomas Morse scout machine which is used for aero-photographic work and exhibitions.

In addition to passenger flights, there is a considerable interest in advertising and illuminated night flying over nearby cities, such as Schenectady, Albany, Troy and Amsterdam. For advertising purposes, Mr. Richard delivered for the Adirondack Power and Light Corporation the first electric range ever shipped by airplane.

This small airport is the nucleus upon which a large field may eventually grow. Situated as it is between surrounding hills which are far enough away so as not to become objectionable and but a few minute's ride from the Electrical City of the world, its future is well established.

The Loening Amphibian

A Patented and Proprietary Article

The way in which this modern design of plane has come to be accepted by the Services and put to use in Alaska, in the Tropics, with the Fleet, and in our overseas possessions, is a great tribute to the correctness of its fundamental design. And the practical day-in day-out hard working service that these planes are giving is the achievement only of a painstaking consistent effort combined with a talented skill in manufacturing.

LOENING AERONAUTICAL ENGINEERING CORPORATION
31ST STREET AND EAST RIVER, NEW YORK CITY

DOPES
PIGMENTED DOPES
VARNISHES ENAMELS
TITANINE
MADE BY
TITANINE, Inc.
UNION, UNION COUNTY, N. J.
Contractors to U. S. Government

GOODYEAR
Everything in Rubber for the Airplane
The Goodyear Tire & Rubber Company, Inc.
Akron, Ohio

WHY

WE RECOMMEND THE

FLASHING BEACON

— Quicker flashes give quicker location
— Distinctive signal gives specific location
— No blind area — visible to zenith
— Low initial cost
— Economy of operation on Airway or Airport

Every city and town with an aviation field should have its own distinctive flashing beacon. Any letter of the Morse Code may be flashed if desired.

Chambers of Commerce or leading hotels, newspapers, banks or department stores recognize the advertising value of this flashing beacon on their building.

May we tell you more about it?
Write for illustrated catalogue.

B.B.T. CORPORATION OF AMERICA

ATLANTIC BUILDING PHILADELPHIA PENNA.

Perry - Austen
COMMERCIAL
Acetate Nitrate DOPES Clear Pigmented

No. 21 Pigmented Eggshell Finish-Nitrate Spray or Brush 2 coats over clear Acetate or Nitrate. Fuselages and wings. Lustrous AUTOMOBILE-like finish. Very attractive, smooth and easy to keep clean.

Perry - Austen Mfg. Co. - Staten Island - N. Y.
Contractors to United States Government

The Weekly Issue of AVIATION That You Miss

because you are not a regular subscriber, may contain the article, news story, picture or advertisement which you could have used with profit.

If you are a service or a civilian flier, AVIATION is an indispensable adjunct to your calling, because in each weekly issue it publishes more service and commercial flying news than appears in any monthly; and, more important, it is NEWS when it appears in AVIATION.

AVIATION

The Oldest American Aircraft Magazine — The Only American Aircraft Weekly

The New Haven Seaplane Convention

The New Haven Air Terminal was responsible for a very successful convention of seaplane pilots and operators in New Haven Harbor on Saturday, Sept. 25. Two parachute jumps, a speed boat race and races for commercial and naval pilots thrilled a crowd of many thousand people lining the East shore from the Tomlinson Bridge to the New Haven Air Terminal hangars.

George Rummill of Lake George, N. Y., flying a Curtiss Seagull, was the high prize winner of the day, coming in first in the "On-to-New Haven" race with his flight from Lake George; first prize in the seaplane race for commercial fliers and second prize in the load contest.

Lieut. H. M. Kernodle, flying a Vought UO-1 (Wright Whirlwind) won the service race at the fast clip of 97 m.p.h., carrying off the New Haven Register Cup.

Observation Squadron No. 6 was awarded a cup for sending planes the greatest distance for the convention. They flew up from Hampton Roads, Va. on Friday, after leaving a third Navy plane, scheduled to enter the races at Philadelphia, Pa., with engine trouble.

During the meet, the 118th Observation Squadron flew down from Hartford but was unable to land at the convention as there is no field available at New Haven.

After the opening parade of fourteen planes, there were a series of stunts by Navy fliers. Immediately followed was a low altitude jump parachute by Gus Graff, holder of the World record for dropping a distance of 2,200 ft. without opening his chute. He aimed for the land just in back of the crowds of spectators but was carried by the wind into the water. Rummill, piloting the plane which dropped him, was down on the water almost before the parachute jumper landed and hurried to pull him aboard before he should be weighted down by the straps of the chute.

Dropping in unexpectedly upon the meet, Charles Ward Hall, manufacturer of all-metal airplanes, surprised the crowd with a 41 min. trip from Larchmont, N. Y. His metal boat, powered with a 60 hp. Lawrence engine and designed for sporting purposes, was a center of attention, though it did not fly in the events.

A dinner was given the visiting fliers at the Cafe Mellone where more than thirty fliers and men interested in flying discussed extensive plans for a similar seaplane convention next year. Lieutenant Welbourn assured the sponsors of the meet of the hearty co-operation and good wishes of the Navy in the plan to put the seaplane before the public eye in an effort to demonstrate its practicability. He stated that after

Denver News

J. S. Charles of Richmond, Virginia, has been appointed Eaglerock dealer for the states of Virginia and North Carolina.

Hill and Markham of Vineland, New Jersey, purchased the Eaglerock used by the Alexander Aircraft Company in the National Mile High Meet, Ford Reliability Tour and the Sesqui Races. They will act as Eaglerock dealers in the states of New Jersey and Delaware.

Tibbs Flying School of Oklahoma City have been equipped with a demonstrator Eaglerock and indications are good for a heavy winter business for their territory in Oklahoma and the Pan Randle of Texas.

Telegram received from A. A. Edwards announces that the Alexander Eaglerock at the World Flight Commemoration Meet, Clover Field, Santa Monica, beat all OX5 ships and won race on points from all other types. Paul Richter, the pilot, covered 137 mile course in 100 minutes flat, including 5 four minute stops, making his average nearly 115 miles per hour.

Mike Campbell, film sales manager of Alexander Industries and Paul Vernier, pilot, successfully completed a 3000 mile business tour this week covering the southern states to Kentucky. They returned over the northern mail route.

Justice McInaney, Eaglerock sales manager, will attend the Washington Aviation conferences in the interests of western flying enthusiasts. After a visit to eastern factories he will return to Denver and take a demonstrator Eaglerock through the South.

Eagle and Plane Collide

A large golden eagle brought down a government airmail plane near Elko, Nev., on October 1.

Colliding with the plane headon, the eagle knocked out a front wing strut, making it necessary for the pilot, E. E. Moulton, to make a forced landing. The eagle, which measured nearly eight feet from tip to tip, was killed.

Moulten said it was necessary to use all his aileron control to keep the plane from turning over following the impact. The plane was damaged to such an extent that it had to be held at Elko for repairs.

The plane was one of the New Swallows, with Wright Whirlwind engines, used on the Varney contract mail line between Elko, Nev., and Pasco, Wash.

Scintilla Mags. on Winning Pursuit Plane

The 600 hp. Packard engine which powered the winning Boeing plane in the free-for-all pursuit plane race at the National Air Races was equipped with magnetos instead of the usual type of Packard ignition. Two type AG 12-D Scintilla's were the magnetos used.

New Albatross Plane

New Pullman plane built by Albatross Works (Berlin) had successful trial trip on August 30, when it flew from Tempelhofer Field, Berlin, to Croydon (London), England.

American Legion Air Circus

Several new ideas in the way of an aviation show were incorporated by "Casey" Jones, in staging the Legion Air Circus for the benefit of the Nassau County Relief Committee, on Sunday, Sept. 26. These innovations, which after all consisted of basic showmanship, kept the crowd's interest at more or less fever heat from start to finish. Not a single person left the field until the chromatic tones of Swanee Taylor, the devoted announcer, bade them adieu right after the double parachute drop which closed the program of the day.

International Newsreel

A section of the crowd and two Curtiss Oriole's which took part in the American Legion Air Meet at Curtiss Field.

Lieut. Doolittle, with Lap Pack type; Lieut. Brookley, with Seat Pack type — IRVIN Air Chutes.

In the Service of U. S. A.

They think nothing about it now. These men of the Army Air Service. They step easily into their "IRVIN" harness before going up. And then as they sit comfortably with the "pack" attached, they forget it entirely. Yet it's ready for instant use—if they need, or want it. And it gives them that confident feeling of "ready for anything". Likewise with the U. S. Navy and U. S. Air Mail services.

Manufactured by

Irving Air Chute Co., Inc.

523 Main Street

Buffalo, N. Y.

Cable Address "Irving, Buffalo"

AIR CHUTES IRVIN TRADE MARK

3

PROPOSALS FOR NAVY TRAINING PLANES

1. In order to encourage the development of aviation and to improve the efficiency of naval aeronautical material, as contemplated by Act of Congress, Public No. 446, approved July 2, 1926, the submission of bids is hereby invited for training planes, convertible land or seaplane type, combined primary and gunnery training, in accordance with designs submitted by the bidder competitively.

2. Each design will be accompanied by a graduated scale of prices for which the designer is willing to construct any or all of the aircraft in lots of one (1), three (3), ten (10), twenty-five (25), fifty (50), seventy-five (75) and one hundred (100), and also a price for which the design in whole or in part will be sold to the Government.

3. All bids with accompanying designs will be submitted to the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., and must be placed in the mail not later than December 10, 1926. No bids or designs mailed thereafter will be considered. Schedules giving detailed information as to the conditions and requirements of the competition and as to the various features and characteristics to be developed, listing specifically the respective measures of merit, will be supplied upon application to the

BUREAU OF SUPPLIES AND ACCOUNTS
Navy Department, Washington, D. C.
CHARLES MORRIS
Paymaster General of the Navy

NITRATE DOPE

NEW PRODUCTION

IMMEDIATE SHIPMENT

Contractors to U.S. Army and Navy

VAN SCHAACK BROS. CHEMICAL WORKS

3358 AVONDALE AVE. - CHICAGO, ILL.

THE NATIONAL AERONAUTIC ASSOCIATION

1623 H Street, N.W. Washington, D.C.

Solicits the Cooperation of

ALL AMERICANS WHO DESIRE TO MAKE AMERICA FIRST IN THE AIR.

We seek, by the promotion and encouragement of civil and commercial air navigation, to contribute to national progress and prosperity and to increase the military safety of the country without giving cause for international jealousy or fear.

Woodson Aircraft

Is Dependable For Any Service

PRODUCED IN SEVERAL MODELS TO SUIT YOUR REQUIREMENTS. 3, 5, AND 7 PLACE, OPEN OR CLOSED, POWERED WITH ANY MOTOR DESIRED. BUILT WITH A HIGH SAFETY FACTOR.

Price $3,500.00 to $9,000.00

Woodson Engineering Company

BRYAN OHIO

Assistant Secretary of War Hanford McNider, a Past Commander of the American Legion, and F. Trubee Davidson, Assistant Secretary of War for Aviation, opened the meet.

The first novelty introduced was the starting of the initial race on time. The second innovation was found in having a flying start. This was an OX-5 race and was for ten miles, three laps on a triangular course of 3.335 miles. Then the race itself was another new idea. At all times the planes were in sight of the audience and the public took keen interest in watching the pilots' battle for position. At no time did the interest wane. This event was won by Ray Schultz in a Waco. Jim Ray was second in a Pitcairn Orowing. "Casey" Jones was third, in a Thomas Morse plane.

Bill McMullen, of the Curtiss Flying Service, gave an exhibition of sky-writing, winding up by penning the name "Gene" in honor of the new heavyweight champion. This thriller came through the courtesy of Jack Cameron, of the Sky-Writing Corporation, who very kindly placed one of his SE-5's at the disposal of the American Legion after the smoke screen airplane lost the chemical tanks through a rough landing.

Then came a superb pursuit stunt formation, led by Lieut. Monk Hunter of the 1st Pursuit Group. For half an hour Lieutenants Hunter, Williams and Smith held the spectators in breathless amazement by their precise and very smooth formation flying.

The second race of the day was the free-for-all, over the same 10 mile course. George Weiss, in a Travel Air, was first and Bert Acosta, in a Curtiss Oriole, was second. Jim Ray, in a Pitcairn, finished third.

The next part of the program consisted of the catching of a baseball, dropped from a plane. Otto, "Mooney", Miller, of the Brooklyn National League team caught the ball, which was dropped by his wife from a plane, in which also was "Merrie" Miller, manager of Curtiss Field. Miller made several attempts before he finally succeeded. The ball was autographed by prominent people present and then auctioned off by Swanee Taylor. Lieut. Sobel, who at one time during the war crashed within a few feet from where Miller made his catch, topped the bidding and carried home the prize.

The National Guard Race, for machines from the 27th Observation Squadron, N.Y. N. G., was won by Lieut. Carl Rach. Lieut. Kendrick Noble was second and Lieut. John Battle third. Lieut. Rach piloted the plane with which he won the National Guard Race at the National Air Races in Philadelphia.

The First Pursuit Squadron of Selfridge Field, which has been stationed at the Sesqui-Centennial grounds for exhibitions, cruised over the field in regular formation. The planes were piloted by Lieutenants Frank Hunter, L. S. Smith and J. J. Williams.

Throughout the afternoon Swanee Taylor maintained a tireless stream of semi-humorous chatter, reminiscent of Model Farms Field, much to the delight of those assembled there. Whenever there was a lull, he was quick to leap into the gap with highly agreeable comedy relief.

United States Air Forces

Army Air Orders

Sec. Lieut. Russell S. Ryan, Air Corps Res., Schenectady, to active service, Fairfield, reverting to inactive status Oct. 17.

Private Andrew Williams, Air Corps, Selfridge Field, transferred to 60th Serv. Squad., Air Corps, Fort Crockett.

Private Thomas Shakespeare, Air Corps, Fort Crockett, transferred to 17th Pur. Squad., Air Corps, Selfridge Field.

Spec. Or. 133, assigning Lieut. Ray G. Harris, Air Corps, Marshall Field, amended to assign him to duty Middletown air intermediate depot, upon completion of foreign service.

Capt. Morris Berman, Air Corps, Washington, to Fairfield.

First Lieut. Cortland S. Johnson, Air Corps, Washington, to McCook Field.

Sec. Lieut. Harold C. King, Air Corps, Mitchel Field, to New York City, sailing Dec. 2 for Canal Zone.

Private Herbert C. Johnson, 19th Airship Co. Air Corps, Langley Field, transferred to Co. D, 1st Motor Repair Bat., Camp Holabird.

Spec. Or. 139, relieving Capt. Robert L. Walsh, Air Corps, from assignment and duty in office of the Chief of Air Corps, and from additional duty as aide at the White House, and assigning him to Langley Field, revoked.

Spec. Or. 171, relieving First Lieut. Clarence F. Horton, Air Corps, from assignment and duty Langley Field, and directing him to sail from New York City, Dec. 2, for Canal Zone, revoked.

Navy Air Orders

Lieut. George T. Dill det. Nav. Air Sta., Pensacola, to duty with first Brigade, U.S. Marines.

Lieut. Commander James M. Shoemaker det. VJ Sqd. One, Aircraft Sqdns., Battle Flt., to Aircraft Sqdns., Battle Fleet.

Lieut. Commander Rico Botta det. VJ Sqd. One, Aircraft Sqdns., Battle Flt.

Lieut. Theodore C. Lonnquest det. VO Sqd. One, Aircraft Sqdns., Battle Flt., to engineer officer on staff, Aircraft Sqdns., Battle Flt.

Lieut. Frank Whitmore det. VJ Sqd. One, Aircraft Sqdns., Battle Flt., to VJ Sqd. 2, Aircraft Sqdns., Battle Flt.

Comdr. Bartlett Succeeds Comdr. Rodgers

Comdr. Harold T. Bartlett has been appointed to succeed the late Commander John Rodgers in the work of long range scouting by aircraft. Commander Bartlett will take command of the PN-10 flying boats under construction at the naval aircraft factory, Philadelphia.

The two flights which had been planned for Commander Rodgers, the coast-to-coast flight by way of the Panama Canal and the flight from San Francisco to Hawaii, will probably be in charge of Commander Bartlett.

Commander Bartlett was graduated from the Naval Academy in 1911 and he has been a naval flier and pilot since 1914.

International Newsreel
Comdr. Harold T. Bartlett U.S.N.

In 1917 he went to France, serving with the British and French forces during the World War. He received training in the British and French aerial gunnery and bombing schools and commanded the naval aviation advance training school at Montchic, France, from Jan. to Aug., 1918. Between 1918 and 1920 he served in the office of operation, Navy Dept., being officer in charge of the gunnery school at the Naval Air Station, Pensacola and from 1920 to 1923 was commanding officer of the scouting fleet's torpedo and bombing plane squadron.

AIRPLANES

Flying Boats Supplies Motors

Dandy Curtiss Oriole Airplane, newly linen covered throughout, less motor, only $1075.—no better bargain anywhere. 220 Hispano Motored Standard, new, $1350.; Dandy new Standard, less motor, $850.; Slightly used JN4D, splendid throughout, $1075. New 12 Cyl. 450 H.P. Liberty Motor only $1650.—regular price $2150 for new ones; New 80 H.P. LeRhone $125.; new 28 H.P. Lawrence $142.50; new OXX6 Curtiss 100 H.P. Motor $600. or Navy overhauled $375.; Splendid 150 H.P. Hispano $625.; 100 H.P. Gnome Rotary Motor $75. FOB. Florida. Landing Gear Struts for JN4D or Canuck:—front, each $2., rear, each $2.50 or $8. for set of 4; 26 x 4 slightly used casing $7.50, or moderately used $5.; newly made tube $2.50; 20 x 4 casing, slightly damaged, $10. 20 x 4 wheel $5.; newly made tube $3.; DH wheel $8.50; DH Casing $10. or fair condition $7.50; new tube $4. or surplus stock $2.25; adapters for attaching to Jenny or Standard $7.50. Cotton or Linen covers all made up for JN4D, Canuck or Standard. JN4D, or Canuck, upper and lower wings $90. each; Standard lower wing $90.; Standard upper wing $110.; Gov't specification cotton cloth 65c yd. or 65 yds. or more at 57½c yd.; cotton 2¼" scalloped tape 6c yd. or 5½c yd. in 110 yd. rolls. Linen 75c yd. or 65c yd. in 65 yd. or more bales; linen tape scalloped 8½c yd. Dope, Varnish and everything. All parts for JN4D, Canuck, Standard, OX5, OXX6, and many Hispano, Clerget, Liberty, LeRhone, Lawrence and Fiat parts.

Send for Aviation Catalog.

Floyd J. Logan Airplane Co.

716 West Superior **Cleveland, Ohio**

PHONE CHERRY 949

OLDEST ESTABLISHED EXCLUSIVELY
AERONAUTICAL SUPPLY HOUSE IN AMERICA

The Aeroplane

Published Weekly

175, Piccadilly, London, W.1
England

CHARLES GREY
Editor

Subscription Rates
for U.S.A.

1 year—$8.50

Where to Fly

CALIFORNIA

THE RYAN SCHOOL OF AVIATION

O. B. STAR ROUTE SAN DIEGO

Ideal flying weather all Seasons. Very best of planes and instructors. Opportunity to study latest planes and construction.

A few recommended students will be given employment in our shops, while learning to fly.

CONNECTICUT

NEW ENGLAND AIRCRAFT CO., INC. New England's largest, most complete airdrome, of 96 acres. Commercial flying service. Complete flying instruction. Inter-city passenger and light express service by appointment. Advertising, photography. Our rates are reasonable and we make commercial pilots. Waco 9 distributors for New England.

805 MAIN ST., HARTFORD, CONN.

FLORIDA

Modern planes for any purpose, at any time. Rates reasonable. Flying schools located at Atlanta, Ga., Daytona Beach and Tampa, Fla., where you can fly in comfort in any season. South Eastern Distributors for Swallow Airplanes.

Address all correspondence to A. B. McMULLEN COMPANY
15 PEACHTREE ARCADE, ATLANTA, GA.

IDAHO

WALTERS FLYING SERVICE
BOISE, IDAHO

COMPLETE FLYING INSTRUCTIONS AND GROUND COURSE

Learn to Fly at High Altitude—then you can fly any place

ILLINOIS *Only 50 miles west of Chicago*

EAGLE AIRPORT SCHOOL OF AVIATION.
Herman J. Neubauer, M.D.
Hinckley, Ill.

Learn to Fly at our up-to-date school at very reasonable prices. Complete ground and air course. Come any time. Ideal accommodations for students. Expert instructors. Write for information.

ILLINOIS

MID-WEST AIRWAYS CORPORATION
MONMOUTH, ILLINOIS.

Complete flying instruction and ground course. Large safe field and good airplanes. Distributors for the new Waco airplane.

ILLINOIS

HEATH AIRPLANE COMPANY, Inc.
Oldest aeronautic establishment in U. S.

Airplane Supplies Flying School
2856 Broadway Chicago

ILLINOIS. **YACKEY'S CHECKERBOARD FLYING FIELD.** *Operated by the Yackey Aircraft Co., one of the oldest flying schools in the U. S.* The Yackey Aircraft Co. is conducted by men who have made a success in all branches of flying before the war — — in the war and after the war — — U. S. Army, U. S. Air Mail and Civilian. You can only learn from one who knows. You only know from experience. We have proven our ability. YACKEY AIRCRAFT COMPANY, Forest Park, Illinois.

ILLINOIS **Campbell De Schepper Airplane Co., Inc.** Best equipped commercial field in the middle west. 24 hour service with night flying equipment and used by N. A. T. mail line Chicago to Dallas. A limited number of students accepted for training at reasonable rates. We invite cross country pilots to make use of our facilities.

Mail address 515-18 ST., MOLINE, ILLINOIS.

KANSAS

ALLISON AIRPLANE CO. *Winter Flying Instruction.* Special rate $100. Room and board $8 a week. Modern planes only used here. Commercial and sport planes at attractive prices. Our factory gives training in airplane construction and an opportunity to assemble your own plane from parts and save money. LAWRENCE KANSAS

MARYLAND LOGAN FIELD.

CHESAPEAKE AIRCRAFT COMPANY, Headquarters Armory, Baltimore. Passenger and express service. Aerial photography and advertising. Flying school $250. for course. No bond for solo. *Agents for TRAVEL AIR Planes, Maryland, Virginia & District of Columbia.* Phone Vernon 3760.

MICHIGAN

NILES SCHOOL OF AVIATION

Guaranteed course of instruction in flying. Enroll at any time. No bond for solo flight. Become an expert pilot under expert instructors.

NILES AIRWAYS NILES, MICHIGAN.

MICHIGAN **LEARN TO BUILD AIRPLANES**
OVERCASHIER AVIATION SCHOOL

8 Arcadia Building, 3513 Woodward, Detroit, Michigan.

Please forward information on practical commercial aviation courses. X .....

Motor expert — Construction — Flying *Established 6 years.*

MISSOURI

BRIDGETON AIRCRAFT CORPORATION

ST. LOUIS FLYING FIELD ANGLUM, MISSOURI.

Thorough flying instructions by the hour or complete course. Ground and air work given by competent instructors. Only new planes used. A personal interest taken in each student.

DISTRIBUTORS OF THE NEW WACO AIRPLANE.

MISSOURI

MUNICIPAL FLYING FIELD. Rates $15.00 per hour. Come when you can and stay as long as you like. Can use a few students to work out part of tuition. No extra charge for oil or gas. Board and room $8.00 per week. All instruction is personal and no charge for ground school or learning to taxi. *Write* LEE R. BRIGGS, MEMPHIS, MO., *for further particulars.*

MISSOURI

NICHOLAS-BEASLEY AIRPLANE CO. Complete flying instructions, by hour or by complete course, primary, cross country, advance training, solo. New ships and new motors. Instructors who take an interest in you. No deposit required on solo flight. Write for full particulars. MARSHALL, MISSOURI.

MISSOURI

LEARN TO FLY! *ONLY $100.* Our instructors of long experience, our modern training airplanes, and the best flying field in the Middle West make us the best equipped school in the country to teach you to fly properly. *Enroll Now.*

PORTERFIELD FLYING SCHOOL, *Richards Field,* Kansas City, Mo.

NEBRASKA

LEARN TO FLY at the LEXINGTON SCHOOL of AVIATION
LEXINGTON, NEBRASKA

Complete flying course $175.00 or $20.00 per hour, no charge for ground school. Taxi service 20c per mile any where, any time. We fly new planes only. Distributors for Swallow airplanes.—G. R. MORTON, *President*

NEW YORK

CURTISS FLYING SERVICE INC., GARDEN CITY, N. Y.

Complete Flying Service including Instruction, Aerial Photography, Advertising and Passenger carrying. Fast cross country transportation at a moment's notice to any point with either land or water types. Air fleet of thirty machines. Flying the year round. *Big reduction in rates for Flying Instruction. Write for information.*

NEW YORK

CURTISS METROPOLITAN AIRPLANE CO., INC.

FLYING BOAT SCHOOL PASSENGER SERVICE

Winter Station Jan. 1-May 1 Palm Beach, Fla.

Port Washington, Long Island

NEW YORK

FLYING SCHOOL—Operated in connection with our shops assuring a Liberal Knowledge of Design and Construction at no additional expense. Competent Instructors. *Reliable Machines.* Passenger Flights and Cross Country Service. Write for Details. AERIAL SERVICE CORP., HAMMONDSPORT, N. Y.

OHIO

JOHNSON FLYING SERVICE
DAYTON, OHIO

GRADUATES OF OUR SCHOOL HAVE A REAL ADVANTAGE

A Flying School of Distinction. Write for Further Particulars.

WHERE to FLY

CONTINUED ON FOLLOWING PAGE

(*Continued on Page* 659)

AN INDEX TO

AVIATION

Covering the contents of the twenty-six issues included in Vol. XX, January to June, 1926—

NOW READY *for* FREE DISTRIBUTION

This index is the key to a wealth of aeronautical information, shows the comprehensive and authoritative character of the material published in AVIATION each week, and will prove of great value for ready reference purposes.

It will be published for each succeeding volume.

If you are not a regular reader of AVIATION, send for a free copy of the Index — a glance at the titles will quickly show why

AVIATION is the Indispensible American Aircraft Publication.

GARDNER PUBLISHING CO., Inc.

225 Fourth Avenue New York City

PUBLISHER'S NEWS LETTER

There is one phase of air transport that is hardly ever considered or mentioned when the subject is discussed, yet which is one of the most serious obstacles that will have to be overcome before air transportation becomes as popular as everyone hopes when the vital problem of safety is assured. Air sickness is gradually assuming an importance that should be given the closest attention. At present there seems to be no successful means of combatting it. While the same difficulty has always been present in travelling by boat, it has been possible for those who are affected in this way to seclude themselves by remaining in their staterooms. As someone who is greatly inconvenienced by air roughness put it; on a boat one is only sick in two dimensions but in a plane the passenger has three to overcome. In fact, at present there is hardly an obstacle that air transport has to overcome that has a more serious aspect than this very acute problem.

* * * *

The number of persons that are affected by the motion of airplanes is variously estimated to be between five and ten per cent. This refers to those that have to resort to the use of air sickness bags that are carried on all well equipped air liners. The number that are made "uncomfortable" is more difficult to estimate, but it is not too much to say that for every trip of a plane carrying from eight to twenty passengers that someone is affected by the motion of the plane. And, of course, in a closed cabin the effect of one person being affected makes it disagreeable for the others. No warning can or is given to the passengers as to the roughness of the air and it is surprising to many air tourists to start out for a flight on what appears to them a perfect day and, then, to find that the air is filled with pockets and gusty wind. On air trips of over two hours, this feature of the flights will have to be faced and given the most careful attention.

* * * *

The causes for this unfortunate disadantage of air travel have not been clearly determined. To many, air sickness is attributed to the closed cabin and while this undoubtedly has some effect, owing to the lack of ventilation in most cabin planes, it is not the real cause. Vibration, too, has been blamed for the discomfort that many feel in the air. While this certainly adds greatly to the underlying cause, it cannot be said to be the fundamental reason. Ventilation is probably the one necessary requirement on an airplane that has been given the least thought by designers. If they provide windows that open, they feel that the passenger can be left to regulate his or her own ventilation. This is, of course, passing the problem to the passenger who may be subject to ill effects of draughts, or may inconvenience the passengers behind, or what is more important may have to suffer cold to secure the proper amount of fresh air.

* * * *

Some of the lines provide so-called "sea sickness" remedies or some passengers who have had experience on rough days carry sleeping powders. These remedies, while they are helpful in certain cases do not go to the root of the trouble. To do this, requires that the designer build his cabin with this important disadvantage in mind. A proper ventilating and heating system should be provided on every air transport plane, a feature that is lacking on most of the planes now in use, or, at least, given the most rudimentary treatment. Window ventilation is worse than useless as the air from a window usually blows on the passengers in the rear and affects all those who are seated back of the open window. In summer or at low altitudes on pleasant days the movable windows may provide a pleasant and refreshing breeze, but when the weather is cool or cold, this form of ventilation is not practicable. Comfortable seats are also too often neglected. The designer believes if he gives the passenger a metal bucket covered with a little upholstery that the view will take his mind off the discomfort. It can be definitely asserted that a comfortable seat is one of the prime requisites of any air transport plane and will have much to do with the state of the passenger's comfort in the air insofar as it is related to sickness. By comfort is meant, not only, roominess and correct padding, but a place to put the head in case of weariness or sickness. To see passengers leaning against windows with coats as pillows, is one of the sights that indicates that the builders of the plane did not know much about the necessities of air travel from the point of view of the passenger or the requirements of a properly equipped airliner. No air transport company that is looking to the future of its passenger traffic can afford to overlook these two important essentials, comfort and ventilation.—L.D.G.

THE Aircraft Service Directory

WHERE TO PROCURE EQUIPMENT AND SERVICES

LANDING LIGHTS

PIONEER INSTRUMENT COMPANY

MAIN OFFICE AND FACTORY BROOKLYN NEW YORK

WASHINGTON 441 STAR BUILDING — PARIS 97 BOULEVARD SAINT MICHEL — SAN FRANCISCO 18 SPEAR STREET

Standard J-1 lower wings, $20.00 to $60.00 each. Upper wings, $50.00 to $100.00 each. Brand new Standard J-1 airplanes, complete with motor, $750.00 up. OX5 Parts. Water Pump Assemblies, $6.00. Exhaust Manifolds, each side, $3.50. Crank Case, lower half, $16.00. Intake Valves, $.30. Exhaust Valves, $.40. Largest stock of strictly commercial airplanes, motors, parts and supplies in the United States. Immediate Delivery. Our flying school is open the year around. Write for new catalog.

NICHOLAS-BEAZLEY AIRPLANE CO.
MARSHALL, MO.

TRADE HAMILTON MARK
PROPELLERS

IMMEDIATE DELIVERY. Complete Hisso Model A Government overhauled motors crated for shipment $525.00. OX5 Standards $700.00 to $1050.00. New Hisso Model E Standards, test flown, $1500.00. New Hisso Model A Standards $1350.00. Hisso compression rings 25c, beveled rings 40c, 3-way Lunkenheimer valves $7.00, Pin or Plate type landing gear (Standard) V's per pair $19.00. New 26x4 tires $7.50. New OX5 coppertipped toothpick propellers $13.50. Spare parts for Standard, Hisso and OX5, instruments, dope, control wire, accessories. Everything sold is guaranteed. Write for prices. P. O. Box 380
J. L. SCHROEDER 6900 Washington Avenue HOUSTON, TEXAS

CHICAGO AERONAUTICAL SERVICE
INCORPORATED
Har. 3272 — Wab. 8104
Aerial Photography — Aerial Advertising
Oblique Pictures — Motion Pictures
Mapping — Passenger Service — Freight — Fast Express
FLYING INSTRUCTIONS: BY REGISTERED PILOTS.
Agents for leading types of modern Airplanes.
OFFICE 608 SOUTH DEARBORN STREET

AIRCRAFT SUPPLIES

Recent additions to our stock of wide variety and large volume of standard and utility aircraft materials and motor parts now enables us to give you prompt and efficient service.

Send for Catalogue No. 8. Special quotations on quantity orders.

MONUMENTAL AIRCRAFT, INC.
1030 N. Calvert St., Baltimore, Md.

WE invite the attention of both the experienced Air Mail contractors and those contemplating new express mail, and passenger routes, to our single and multi engined convertible, land or seaplane types of

TRANSPORT PLANES

HUFF DALAND AIRPLANES, INC.
475 Fifth Ave., NEW YORK. *Factory*, BRISTOL, PA.
"Specialists in U. S. Air Service Bombardment Planes"

New
— LIBERTY MOTORS —
WITH ALL THE LATEST IMPROVEMENTS.
CAN SUPPLY FROM STOCK ANY NEW "LIBERTY" PARTS DESIRED.
WRITE OR WIRE FOR PRICES.
JOHNSON MOTOR PRODUCTS, Inc.
518 West 57 St., New York.

New JN4Ds, $790.00; slightly used JN4Ds $600.00; Good used JN4Ds $500.00, Love Field, Dallas, Texas.

SPARES FOR JN4Ds. Wings lowers $40.00, uppers $50.00, ailerons $10.00. Stabilizers $15.00, Flippers $8.00, Canuck Rudders $10.00. Fins $2.00, struts $1.75, landing gear $30.00, Wheels $5.00, axle $2.00, Turtle back $15.00, cockpit cowl $30.00, bottom pan $4.00, control assembly $20.00, Gas tank $10.00, Fuselage $85.00, seat $4.00.

Jennies, Standards, OX5, Hisso Motors, Propellers, Instruments

Southern Airways, Inc., 210 College Street, San Antonio, Texas.

BOSTON NEWSWRITING SERVICE

Publicity and advertising in Boston and New England newspapers by men with active newspaper knowledge and contacts. Aviation accounts handled personally by Daniel Rochford, aviation editor, Boston Evening Transcript. Ceremonies arranged and carried out. Consultation free. Temporary or year round service basis. Address all communications to

DANIEL ROCHFORD
G.P.O. BOX 2433 BOSTON, MASSACHUSETTS.

TRAVEL AIR AMERICA'S FOREMOST COMMERCIAL AIRPLANE

Sold in New York, New Jersey and Pennsylvania *by*

GEO. A. WIES, INC.

Hangar
Curtiss Field
250 Jackson Avenue
Mineola, New York

SEAMLESS STEEL TUBING

Made to Aircraft Specification 10225-D
Warehouse stock also mill shipment.

THE CLEVELAND TOOL & SUPPLY COMPANY
1427-1437 WEST SIXTH ST. CLEVELAND, O.

YACKEY TRANSPORT

Liberty 12 motor. Landing speed is 32 miles per hour, high speed 125 m.p.h.; useful load 2400; ceiling with load 22,000 ft., duralumin construction throughout. Best performing ship ever known. Price $7,500.00.

Yackey Aircraft Co., Yackey's Checkerboard Airplane Field
DesPlaines River & Roosevelt Road FOREST PARK, ILL.
(Suburb of Chicago)

LOOK LOOK LOOK

New OX5 Standard, covered with all new linen and tito dope. Covering tight as a drum. Has lots of special work and is a very high performing Standard. Also have entry OX5 motor that has not had to exceed fifty hours and just had the valves ground, all complete ready to set in ship, less magneto. Price of ship $825.00. Price of motor $135.00. Or both ship and motor $925.00. Write or wire as they won't last long at this price.

Shannon & Wert Bros. Parsons, Kansas

AIRCRAFT SERVICE DIRECTORY

CONTINUED

EVERYTHING FOR THE AIRPLANE

Send for Our Catalogue

LARGEST AIRPLANE SUPPLY HOUSE IN THE WEST

A complete line of parts and accessories for aircraft at lowest prices.
A money-back guarantee on everything sold.
WRITE OR WIRE US YOUR REQUIREMENTS.

CRAWFORD AIRPLANE COMPANY
"Masters of the Air."
350 WASHINGTON BLVD. VENICE, CALIFORNIA

HASKELITE PLYWOOD

Only Plywood made to pass strict Grade "A" Navy Specifications.

Can be furnished in any size or thickness.

HASKELITE MANUFACTURING CORPORATION
133 W. WASHINGTON ST., CHICAGO, ILL.

AIRCRAFT SERVICE DIRECTORY
A Market Place for the Aircraft Industry.

LUDINGTON EXHIBITION COMPANY

Passenger Flying	AGENTS	Spares of All Kinds
Instruction	FOR	Sport Farman Ships
Victor Dallin—	WACO	Aerial Taxi Service
Aerial Photography	NINE	Exhibition Flying

Office: Atlantic Bldg. PHILADELPHIA
Flying from Pine Valley Field PINE VALLEY, N. J.

AIRPLANE COVERS

NEWLY MADE GRADE A COTTON COVERS.
Complete set, Jenny $100.00; Canuck $105.00; Standard $110.00.

	JN.	CAN.	STD.		JN.	CAN.	STD.
Fuselage	14.00	14.00	14.00	Center sec.	3.00	3.00	3.00
Aileron ea.	4.00	4.00-3.00	5.00	Rudder	4.00	4.00	4.00
Fin	1.75	1.75	1.75	Elevator ea.	3.50	3.50	3.50
Turtle back	1.75	1.75	1.75	Upper wing	15.00	15.00	18.00
Hor. stab.	7.00	7.00	7.00	Lower wing	13.00	15.00	15.00

Fit guaranteed. *Send 25% with order.*
Sweebrock Aviation Co., 1117 Fairfield Ave., Ft. Wayne, Ind.

Daniel Guggenheim School of Aeronautics

Courses in Aeronautical Engineering and Industrial Aviation. For particulars apply to the Dean of the College of Engineering,

N. Y. University, University Heights, New York, N. Y.

This Section Is Growing With Every Issue

FOR SALE: Orenco Light Transport, a strictly modern, 5-passenger commercial airplane, with side-by-side dual in rear cockpit, high speed, 110 m.p.h., landing 40, ceiling 19,000, gas capacity 85 gals., price complete, with 180 Hisso and Reed propeller, $3,750. New Standards $1,000. up, good Jenny $800., 2-place Newport $500.

ROOSEVELT AERO SERVICE
WESTBURY, LONG ISLAND, N. Y.

We Specialize in Simple and Alloy Steels to U. S. Government Specifications.

Most grades are carried regularly in our warehouse.
Hot and cold rolled bars and strips.

THE DICKERSON STEEL COMPANY
DAYTON, OHIO.

JN-4D's, $750.00 and up. Comet OX-5, $2,000.00. K-6 Oriole, metal prop., $1,250.00. Comet K-6, $3,750.00. S.V.A., $1,750.00. Special OX-5 sport plane, $1,500.00. Special Hisso Sport Plane, $1,250.00.

Ireland Aircraft, Inc., Garden City, N. Y.

THE AEROPLANE
PUBLISHED WEEKLY
175, PICCADILLY, LONDON, W.1, ENGLAND
CHARLES GREY, EDITOR
Subscription Rates for U.S.A. 1 year—$8.50

DIRECTORY ADS BRING RESULTS

Ask Our Advertisers

KREIDER-REISNER AIRCRAFT CO. INC.
MANUFACTURERS AND DISTRIBUTORS
of airplanes, aircraft materials and special equipment such as Berling D81 Booster equipment, special airplanes. Rebuilding and repairing done at moderate prices. Ask for our catalog of JN and OX parts and supplies.

WACO NINE DISTRIBUTORS.
HAGERSTOWN MARYLAND.
Telephone, Hagerstown 2147W (or 2288 at night only)

WILLIAM E. ARTHUR & CO., INC.
103 PARK AVE., NEW YORK CITY
Engineers and Builders
HANGARS — AIRPORTS — FLYING FIELDS,
DRAINAGE, LIGHTING SYSTEMS, EQUIPMENT, ETC.
A SATISFIED CLIENT OUR MOTTO.

AIRCRAFT SERVICE DIRECTORY
CONTINUED

Air Spec. 10225D
SEAMLESS STEEL TUBING
Complete Warehouse Stock for Immediate Shipment in any Quantity.
SERVICE STEEL CO. 1435 Franklin St. DETROIT, MICH.

C. FAYETTE TAYLOR, M. E.
Consulting Mechanical Engineer
Massachusetts Institute of Technology
CAMBRIDGE, MASS.
Specialist in Aeronautical Engines and Marine Engines

10 AIRPLANES $10
From complete planes and rough materials.
Cash orders only answered.
4 blueprints $1.00, or 2 books $1.00.
3118 Wayne St. - Vinoway - Kansas City, Mo.

DECATUR AIRCRAFT COMPANY
DECATUR, ILLINOIS.
New and Used Ships for Sale
Parts for JN4D-JN4C or Standard J1 Ships
OX5-OXX6-Hisso or Liberty Motors
Complete Flying Course—$150.00
Write for our new catalog

THE DETROIT AERO MOTORS CO.
10331 CHARLEVOIX AVE., DETROIT, MICH.
Hispanos, 180 and 300 H.P.
Anzanis, OX5's, new and used.

FOR SALE: JN-4H, a brand new high lift wing job, single bay, 32 foot span, entire ship covered with new cloth and in the very best condition. Price $900.00. Leonard Dickman, R.R. No. 5, Box 11, Freeport, Ill.

FOR SALE: Brand new OXX3 motor $450.00. Includes extra Berling magneto, equipped for installing. Also have excellent used OX5 and parts of dismantled Jenny. H. Keil, c/o E. W. Robertson, R.R. No. 5, Alexandria, Va.

WACO: Bought new in June, only flown 30 hours, wonderful motor, act quickly, fourteen hundred takes it. Extra prop. with it. Art Arrowsmith, Kutztown, Pa.

CLASSIFIED ADVERTISING

10 cents a word, minimum charge $2.50, payable in advance. Address replies to box numbers, care AVIATION, 225 Fourth Ave., New York.

PARACHUTES new and used, for exhibition and emergency use, rope ladders for stunt men, balloons, etc. Established 1903. Thompson Bros. Balloon Co., Aurora, Ill., U.S.A.

FOR SALE: Curtiss Seagull, C-6 motor, metal propeller, and spare parts, like new, $1,800. Box 496 AVIATION.

FOR SALE: Curtiss Seagull Loening air yacht, and Liberty motors. Curtiss Metropolitan Airplane Co., Port Washington, Long Island, N. Y.

FOR SALE: A-1, Curtiss K-6 motor, completely overhauled, very good condition, with C-6 camshafts and bearings, Bosch magneto, and propeller hub. Owner going South, needs the money. Price $550.00. Sextan Vail, c/o American Brick Corp., Princess Bay, Staten Island, N. Y.

PILOT: Wants position with reliable firm. French and American Army Chasse training and six years of commercial flying. Experienced on all types of air and water-cooled motors and on photography and night flying. Box 502 AVIATION.

FOR SALE: One K-D Standard fuselage and one set of four high lift wings, uncovered, four ailerons, USA 35B wing curve, $350.00. Cash FOB field, or $400.00 crated. FOB Portland. Wanted: One new 180 Hisso, state price and guaranteed condition. Box 4268, Rankin Flying Service, Portland, Ore.

FOR SALE: One new OX5, never run. A bargain at $300. Address S. E. Woodford, 44 Goodyear Ave., Akron, Ohio.

PILOT: Ten years' experience. All types. Present contract expires November first. Wants to make change. Holds contract air mail pilot's license. Flown in thirty states. Experienced night flying. Will go anywhere. Box 504 AVIATION.

FOR SALE cheap: One new and 100 per cent complete HS-2L boat, less motor. Veneered hull and other improvements. Never been set up. Everything in excellent condition. A good buy. Must make room for other ships. Richmond Airways, Inc., No. 1 Annadale Road, Green Ridge, Staten Island, New York City.

WANTED: 220 hp. Hispano-Suiza engine, new or used, but must be complete. Edwards Motor Co., 311 South 12th St., Minneapolis, Minn.

FOR SALE: 2 used Martin commercial planes, model 70, in first class flying condition, with spare engine and other spare parts. No reasonable offer refused, as we need manufacturing space. The Glenn L. Martin Company, Cleveland, Ohio.

POSITION WANTED: Aviation engine mechanic and rigger, six years instructor on engines, Army Air Service. Expert on engine overhaul and trouble-shooting. Air mail, factory and barnstorming experience. Box 505 AVIATION.

300 H.P. Wright Hisso, like new, $750.00. Also other Hissos from $250.00 up. Guaranteed OX-5's $225.00. Heath Airplane Company, Chicago, Ill.

$3,500 worth of airplanes and motors, will trade for improved Waco Nine. These airplanes and motors are A-1 and this price is for quick sale. Must be seen to be appreciated. Don't write—see them. Danville Airplane Service, Danville, Ill.

Brand new Aeromarine, 39-B, seaplane, complete, with OXX6 motor, never uncrated. Also two used OXX6 motors. Price for the lot $1,250. Box 506 AVIATION.

Where to Fly

CONTINUED

OHIO

INDIAN LAKE AVIATION COMPANY
RUSSELL'S POINT, OHIO.

Learn to fly for $125.00 at Indian Lake, Ohio's million dollar playground. First class at this price, starting Nov. 1. We are in our seventh successful season of training and passenger work.

OREGON.

FLY IN THE NORTHWEST.

RANKIN SCHOOL OF FLYING - 408 Oregon Building.
PORTLAND, OREGON.

PENNSYLVANIA — *PITTSBURGH*

PITTSBURGH-McKEESPORT AIR PORT — 9 miles from business center of Pittsburgh; 2 miles from business center of McKeesport; Fast Interurban Cars past field. *A splendid fourway field — Look for our big circle.* Eastern Distributing Point for Swallow Airplanes. *Office address,* 504 STANDARD LIFE BLDG., Opposite P. O., PITTSBURGH, Pa. *Visitors Cordially Welcome.*

PENNSYLVANIA

PITCAIRN AVIATION, Inc.
Land Title Bldg. Philadelphia.

4-way flying field, largest in East, on Doylestown pike, above Willow Grove.

4 instructors, ideal flying country, busy field, reasonable board. Our flying course includes meteorology, map-reading, etc. Waco, Standard, Oriole and Jenny airplanes available for graduate students at low rate. No liability bond required.

WRITE FOR BOOKLET.

TEXAS Year-roundFlying

SAN ANTONIO AVIATION & MOTOR SCHOOL
Expert instruction in flying and mechanics
Free sleeping quarters at Airdrome
AIRPLANES, ENGINES, PARTS, SUPPLIES, SHOPS, HANGARS, OX5s, Hissos, Liberties, Jennies, Canucks, Standards
Large stocks on hand, prompt shipment, best values.
Office 509 Navarro Street San Antonio, Texas.

YOUR card, in this directory, serves to keep your flying service continuously before the readers of AVIATION at trifling cost.

Write for Rates

AVIATION

225 Fourth Avenue, New York City

INDEX TO ADVERTISERS

Advance Aircraft Co. 637
Aircraft Service Directory 656-657-658
American School of Aviation 647
Alexander Aircraft Co. 647
Arthur & Co., Inc., William E. 657

B.B.T. Corp. of America 649
Boston Newswriting Service 656
Bureau of Supplies and Accounts 650

Chicago Aeronautical Service 656
Classified Advertising 658
Cleveland Tool & Supply Co., The 656
Consolidated Aircraft Corp. 639
Crawford Airplane & Motor Co., Inc. 657
Curtiss Aeroplane & Motor Co. 619

Decatur Aircraft Co. 658
Detroit Aero Motors Co. 658
Dickerson Steel Co. 657

Goodyear Tire & Rubber Co. 648
Guggenheim School of Aeronautics, Daniel 657

Hamilton Aero Mfg. Co. 656
Haskelite Mfg. Co. 657
Huff, Daland & Co. 656

Ireland, G. S. 657
Irving Air Chute Co., Inc. 650

Johnson Airplane & Supply Co. 646
Johnson Motor Products, Inc. 646

Kreider-Reisner Aircraft Co., Inc. 657

Loening Aeronautical Engineering Corp. 648
Logan Airplane Co., Floyd J. 652
Ludington Exhibition Co. 657

Martin Co., The Glenn L. 641
Monumental Aircraft Co. 656

National Aeronautic Association of U.S.A. 651
Nicholas-Beazley Airplane Co. 656

Packard Motor Car Co. 618
Perry-Austen Manufacturing Co. 649
Pioneer Instrument Co. 656
Pratt & Whitney Aircraft Co. 643

Robertson Aircraft Corp. 645
Roosevelt Aero Service 657
Ryan Airlines, Inc. 635

Schroeder, J. L. 656
Scintilla Magneto Co., Inc. 619
Service Steel Co. 658
Southern Airways, Inc. 656
Sweebrock Aviation Co. 657

Taylor, C. Fayette 658
Titanine, Inc. 648

Valentine & Co. 631
Van Schaack Bros. Chemical Works, Inc. 651
Vinoway 658

Weis, Geo. A. 656
Where to Fly 653-654
Wright Aeronautical Corp. 660
Woodson Engineering Co. 651

Yackey Aircraft Co. 656

WRIGHT WHIRLWIND ENGINES
WON
FIRST—SECOND—THIRD

In the Second Annual Airplane Reliability Tour
August 7th - 21st

Covering 2560 miles over ten States, starting and finishing at Detroit, Mich.

First —"Travel Air," 4-seater, built by Travel Air Mfg. Co., Wichita, Kansas, carrying 600 lbs. contest load, average speed 124.5 m.p.h. Powered with one WRIGHT WHIRLWIND engine.

Second —"Airster," built by Buhl-Verville Aircraft Company, Detroit, Mich., carrying 800 lbs. contest load, average speed 113.5 m.p.h. Powered with one WRIGHT WHIRLWIND engine.

Third —"Detroiter" built by Stinson Aircraft Corp., Northville, Mich., carrying 640 lbs. contest load, average speed 106.7 m.p.h. Powered with one WRIGHT WHIRLWIND engine.

Ryan M-1, built by Ryan Airlines, Inc., San Diego, Calif., carrying 500 lbs. contest load, average speed 111.8 m.p.h. Powered with one WRIGHT WHIRLWIND engine.

Ford 3-engine Airliner, built by the Airplane Division, Ford Motor Company, Dearborn, Mich. Powered with three WRIGHT WHIRLWIND engines.

National Air Races—*Philadelphia, Pa.*
September 4th - 11th

WRIGHT WHIRLWIND *engines won twelve of the eighteen prizes they contested for.*

Air Transport Race—First in Speed and Efficiency, "Wright-Bellanca", powered with one WRIGHT WHIRLWIND engine, carrying 1607 lbs. contest load, average speed 121.53 m.p.h. Second in Speed and Third in Efficiency, Buhl-Verville "Airster" powered with one WRIGHT WHIRLWIND engine, carrying 1059 lbs. contest load, speed 119.97 m.p.h. Third in Speed, Ford 3-engine Airliner, powered with three WRIGHT WHIRLWIND engines, carrying 2666 lbs. contest load, speed 114.26 m.p.h.

Light Commercial Airplane Race—Trophy won by "Wright-Bellanca", powered with one WRIGHT WHIRLWIND engine, carrying 1145 lbs. contest load, speed 121.36 m.p.h. Third in Speed and Efficiency, "Travel Air", powered with one WRIGHT WHIRLWIND engine, carrying 666 lbs. contest load, speed 127.2 m.p.h.

Denver Mile High Air Meet
August 1st - 3rd

First place in Speed Race for over 100 H.P. planes won by Ryan M-1 powered with one WRIGHT WHIRLWIND engine.

First place in 5000 ft. altitude climb for over 100 H.P. planes won by Ryan M-1, powered with one WRIGHT WHIRLWIND engine.

First place—Best General Ship at Meet—won by Ryan M-1, powered with one WRIGHT WHIRLWIND engine.

WRIGHT AERONAUTICAL CORPORATION

PATERSON, N. J., U. S. A.

That's why More Pilots fly them!